10-3930-634-12

TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL

MAINTENANCE MANUAL

TRUCK, LIFT, FORK; DIESEL ENGINE, PNEUMATIC TIRED WHEELS, ROUGH TERRAIN, 6,000 LB. CAPACITY, 24" LOAD CENTER ANTHONY MODEL MLT 6-2 ARMY MODEL MHE-230 NSN 3930-00-327-1575

HEADQUARTERS, DEPARTMENT OF THE ARMY

JANUARY 1977

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WARNING

Be extremely careful when removing the radiator filler cap of a hot engine. Release of pressure may cause violent boiling and serious injury to personnel.

WARNING

Avoid contact with electrolyte. If electrolyte comes in contact with eyes, flush thoroughly and immediately with cold water. Do not rub. Thoroughly and immediately wash all parts of the body touched by electrolyte with cold water.

WARNING

Before disconnecting any electrical components, make sure battery cables are disconnected at batteries to prevent a serious burn or shock to personnel, or damage to equipment. Disconnect battery ground cable first. When reconnecting batteries, starter or any bare, unprotected wires, coat with silicone rubber adhesive.

WARNING

Always bleed off the pressure before opening any part of the hydraulic brake system by operating the brake pedal several times with the engine not running. Failure to observe this warning may result in serious injury to personnel.

WARNING

Insure lockring is properly seated before inflating tire. Serious injury to personnel may result should lockring snap out of seat.

WARNING

Do not operate forklift without engine/transmission side panels installed.

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *28 January 1977*

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL
TRUCK, LIFT, FORK; DIESEL ENGINE, PNEUMATIC TIRED WHEELS ROUGH TERRAIN, 6000-LB. CAPACITY, 24" LOAD CENTER ANTHONY MODEL MLT 6-2, ARMY MODEL MHE-230 NSN 3930-00-327-1575

REPORTING OF ERRORS

You can help improve this manual by calling attention to errors and by recommending improvements and by stating your reasons for the recommendations. Your letter or DA Form 2028, (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander US Army Tank-Automotive Command, ATTN: DRSTA-MSP, Warren, MI 48090. A reply will be furnished direct to you. For your convenience, preaddressed DA Forms 2028-2 are included as final pages of this manual.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope
This manual is for your use in operating and maintaining The Anthony Co. Model MLT-6-2 (Army Model MHE-230) wheelmounted rough terrain fork lift truck. It provides information on the maintenance of the equipment that is within the scope of the tools, equipment, personnel and supplies that are normally available to using organizations.

1-2. Maintenance Forms and Records
Maintenance forms and records that you are required to use are explained in TM 38-750.

1-3. Reporting of Errors
You can improve this manual by calling attention to errors and by recommending improvements using DA Form 2028 (Recommended Changes to Publications), or by a letter, and mail directly to Commander, U.S. Army Tank Automotive Command, Attn: DRSTA - MSP, Warren, MI., 48090. A reply will be furnished directly to you.

1-4. Destruction of Army Materiel to Prevent Enemy Use
Procedures for the destruction of Army materiel to prevent enemy use are explained in TM 750-244-3.

1-5. Administrative Storage
Administrative storage procedures are explained in TM 740-90-1.

Section II. DESCRIPTION AND DATA

1-6. Description
The rough terrain forklift truck (figs. 1-1 and 1-2) is capable of operating over all types of terrain. It is equipped with front and rear axle steering which enables it to move sideways at 20° angles and gives the truck a shorter turning radius. The truck is also equipped with two-wheel and four-wheel drive, enabling it to travel through mud, snow, sand and steep grades with equal facility. The body and forks of the truck may be tilted right or left in relation to the front axle. The forks are extended by hydraulically-operated, telescoping arms which reach out, up, or down to handle loads. A hydraulic cylinder moves the forks right or left of center to lift off-center loads. The truck has expanding-tube type hydraulic brakes, hydraulically-operated power steering and a torque converter. The maintenance paragraphs of this manual contain detailed descriptions of the truck's components.

1-7. Difference in Models
This manual covers only the Anthony Company MLT6-2 (Army Model MHE-230) fork lift truck. No known differences exist for the model covered by this manual.

1-8. Tabulated Data
a. Identification. The forklift truck has an identification plate mounted on the left side of the hull which specifies the nomenclature, shipping dimensions, model number, and engine manufacturer. The data from this plate can be found under tabulated data (*b* below).

b. Tabulated Data.

(1) *Corps of Engineers "A" plate.*

Nomenclature	Truck, lift, fork, diesel, pneumatic tire, 6,000 lb. capacity at 24 in. load center.
Serial No.	
Length	228 in.
Width	102 in.
Height	131 in.
Cap. or payload	6000 lbs.
Cube	1760 cu. ft.
Engine manufacturer	Detroit Diesel
Model	5043-7000

(2) *Dimensions and weights.*

Cube	1760 cu. ft.
Length	228 in.
Width	102 in.
Height	131 in.
Weight:	
Empty	24,560 lbs.
Maximum loaded	30,560 lbs.
Front wheel weights:	
Empty	8645 lbs.
Loaded	16,952 lbs.
Rear wheel weights:	
Empty	15,915 lbs.
Loaded	13,608 lbs.

(3) *Capacities*

Fuel tank	110 gal.
Hydraulic tank	200 qts.
Transmission	32 qts.
Crankcase w/filter	16 qts.
Radiator	25 qts.
Planetary drive	4 qts. ea.
Differential	10qts. ea.

(4) *Wiring diagram.* See figure 1-3.

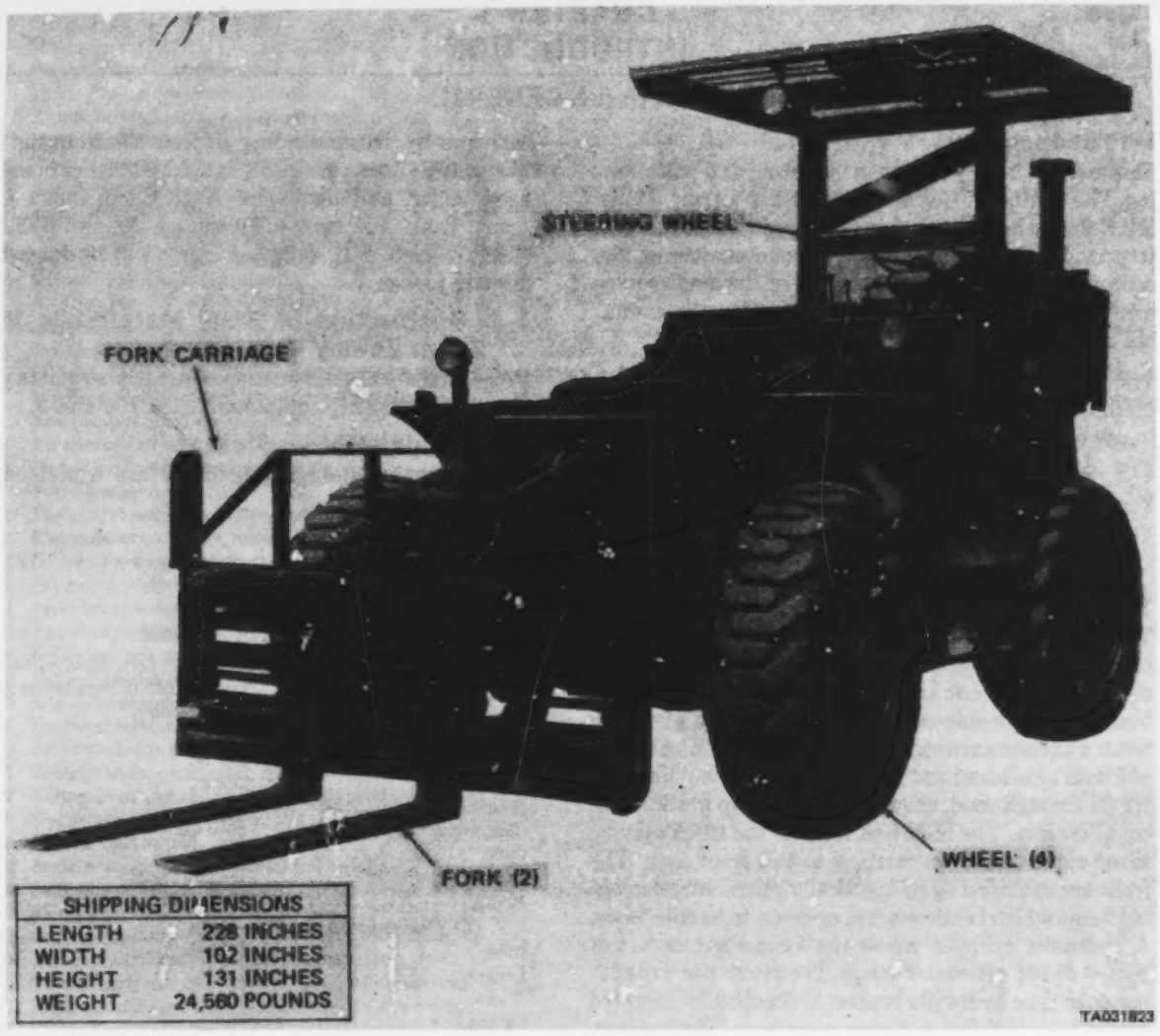


Figure 1-1. Rough terrain forklift truck, right front, three-quarter view with shipping dimensions.

Figure 1-2. Rough terrain forklift truck, left rear, three-quarter view.

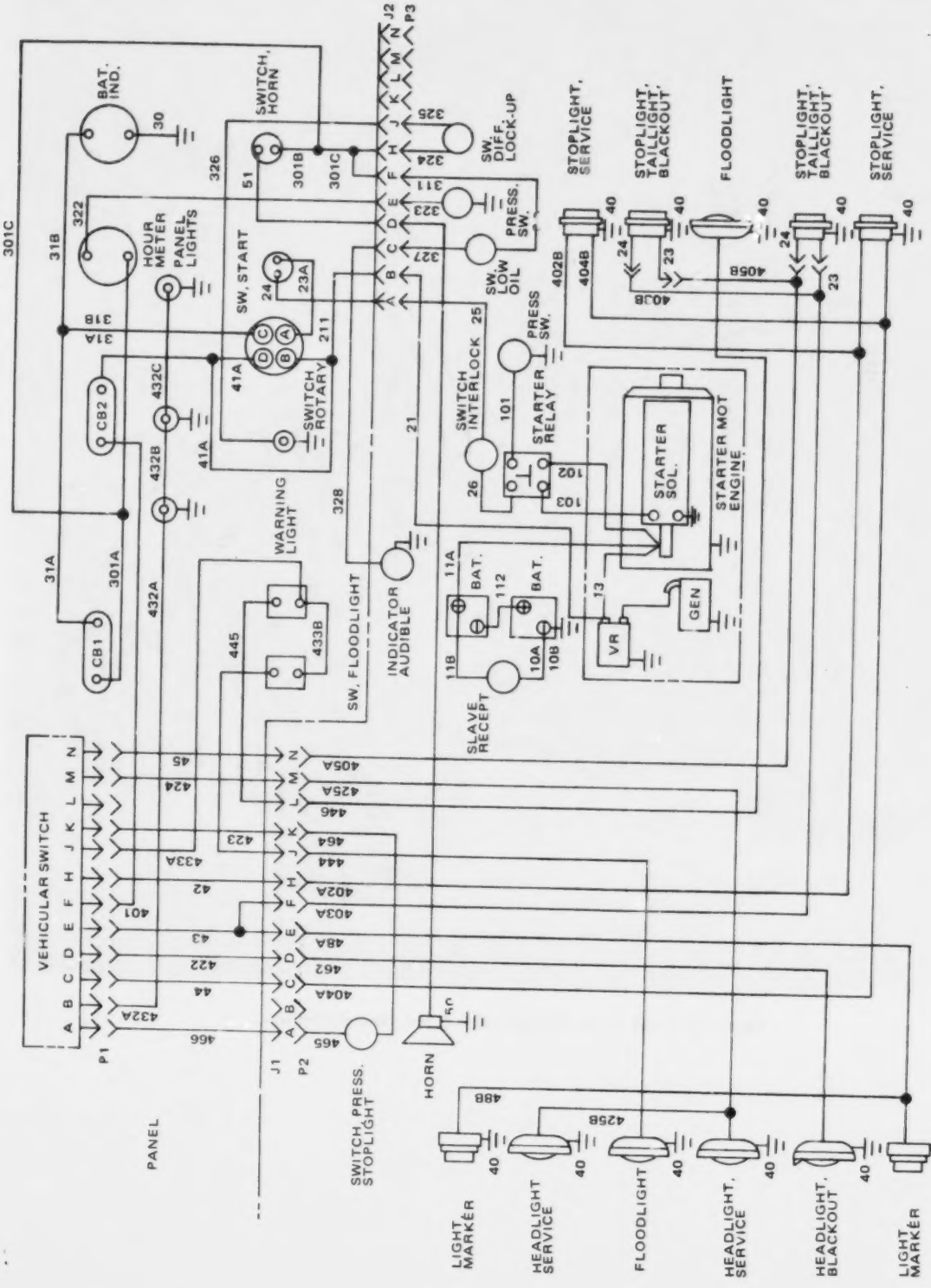


Figure 1-3. Wiring diagram.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. OPERATION UNDER NORMAL CONDITIONS

CAUTION

If equipment fails to operate, refer to troubleshooting procedures in chapter 3.

2-1. General

a. The instructions in this section are published for the information and guidance of the personnel responsible for the operation of the forklift truck.

WARNING

When climbing into the driver's seat, be careful not to bump head on roll over protective structure.

b. The operator must know how to perform every operation of which the forklift is capable. This section gives instructions on starting and stopping the forklift truck, operation of the forklift, and on coordinating the basic motions to perform the specific tasks for which the equipment is designed. Since nearly every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

c. The outside steering radius of the forklift is 30 feet in cramp mode and 43 feet in the two-wheel steer mode. Drift is 20° in crab mode. If steering difficulty is encountered in the cramp or crab modes of steering, it may be feasible to continue operation in the two-wheel steer mode.

2-2. Controls and Instruments

This paragraph describes the various controls and instruments and provides the operator/crew sufficient information to insure proper operation of the forklift truck. Refer to figure 2-1 for the purpose, normal reading and location of all controls and instruments.

2-3. Starting

a. Preparation for Starting.

(1) Perform the before operation preventive maintenance check and services (table 3-1).

(2) Lubricate the forklift as specified in the current lubrication order.

b. Starting.

NOTE

Starting circuit is operative only when the Forward-Neutral-Reverse control lever is in neutral.

CAUTION

Continue only if there is no apparent loss of hydraulic oil and no unusual noise from the hydraulic pump.

Refer to figure 2-2 and start the forklift.

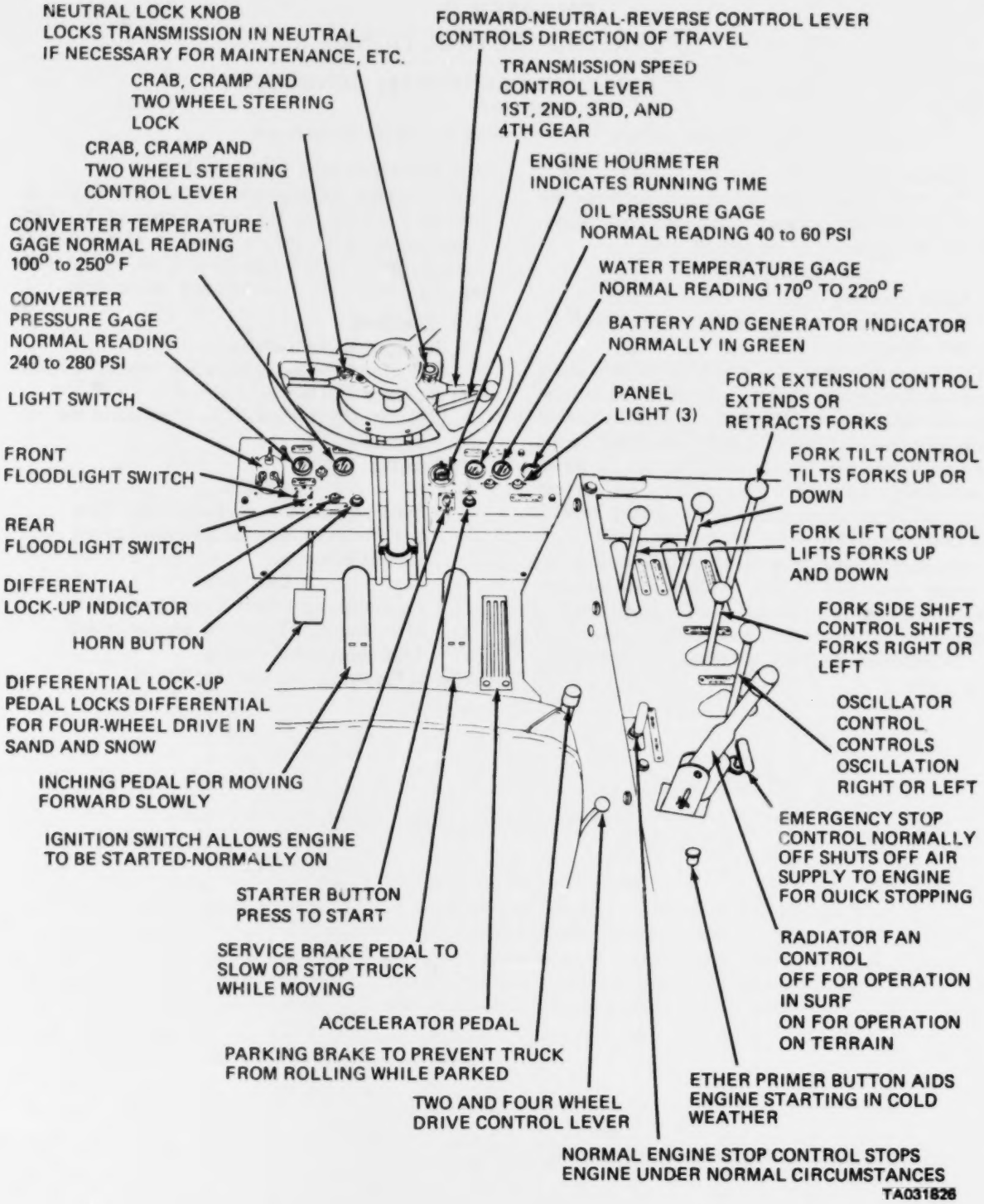
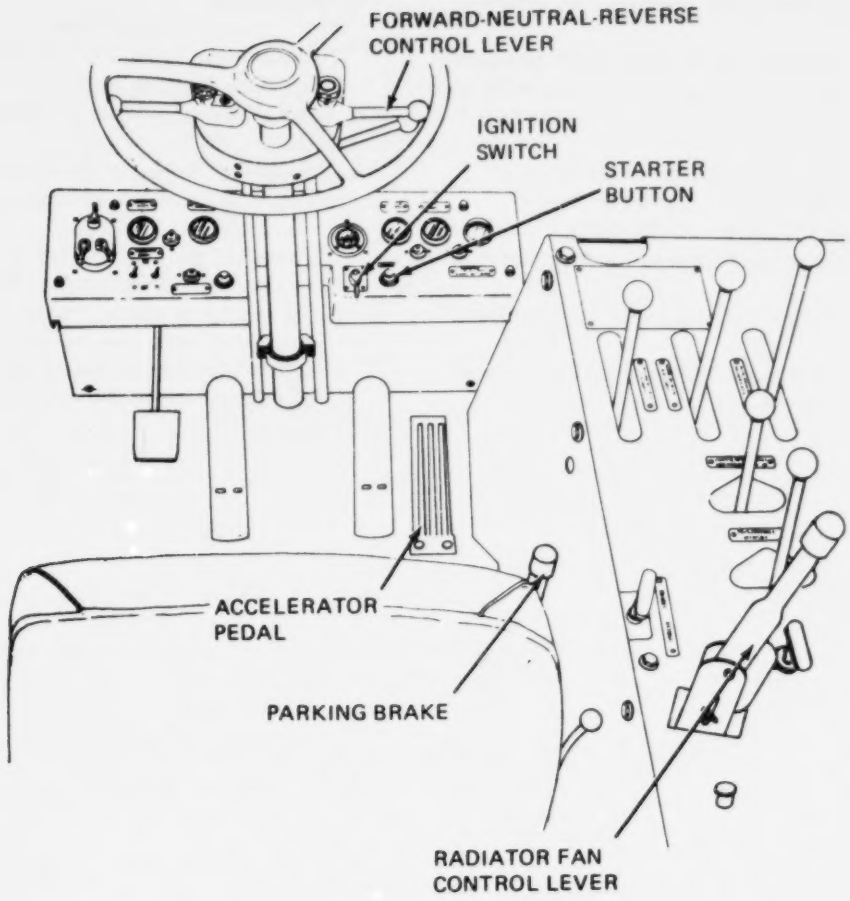


Figure 2-1. Controls and instruments.



STEP 1: PLACE FORWARD-NEUTRAL-REVERSE LEVER IN NEUTRAL POSITION.
STEP 2: ENGAGE PARKING BRAKE.
STEP 3: PLACE IGNITION SWITCH IN ON POSITION.
STEP 4: PRESS ACCELERATOR PEDAL DOWN ONE THIRD DISTANCE.
STEP 5: PRESS STARTER BUTTON.
STEP 6: WARM ENGINE FOR THREE TO FIVE MINUTES AND OBSERVE INSTRUMENTS FOR NORMAL READINGS (FIG.2-1).
STEP 7: CHECK RADIATOR FAN CONTROL LEVER FOR PROPER POSITION.
STEP 8: REMOVE FOOT FROM ACCELERATOR PEDAL.

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Figure 2-2. Engine starting instructions.

2-4. Operation of Equipment

a. General. The rough terrain forklift truck is capable of operating over all types of terrain, sand, snow and steep grades with equal facility. The transmission's four speeds may be used flexibly, depending on weight of load and terrain conditions. When the forklift is carrying a full load or travelling over extremely rough terrain, the speed ranges for the transmission are as follows:

1st gear — up to 4 mph.
2nd gear — 3 through 7½ mph.
3rd gear — 5 through 14 mph.
4th gear — 12 mph. and over.

b. Driving on Improved Surface. Refer to figure 2-3

for driving instructions while operating on improved surfaces.

c. Driving on Unimproved Surface. Refer to figure 2-4 for instructions for driving in surf, and refer to figure 2-5 for instructions for driving in snow or sand.

CAUTION

Do not attempt to cross a side slope 30° or more with the truck in four-wheel steering because the truck may overturn.

d. Picking Up Load on Improved Surface. Refer to figure 2-6.

e. Picking Up Load on Unimproved Surface. Refer to figure 2-7.

f. Depositing of Load on Improved or Unimproved Surface. Refer to figure 2-8.

2-5. Stopping

CAUTION

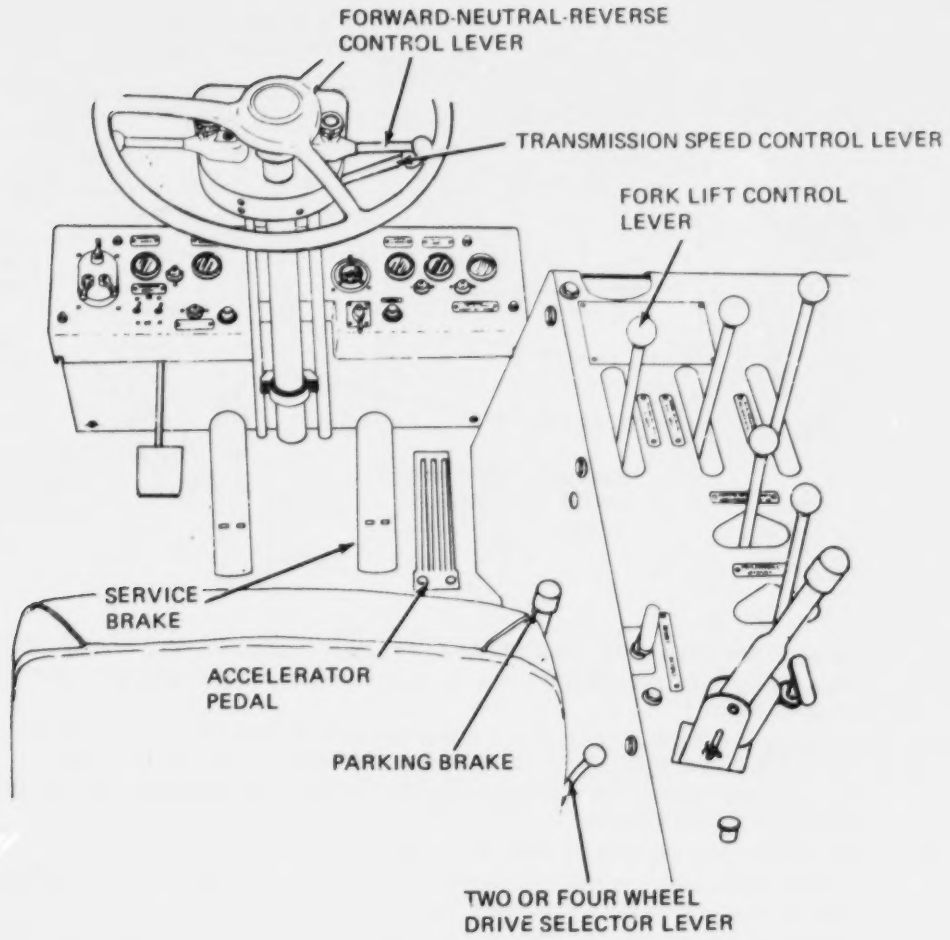
Position forks in DOWN and CENTER position before stopping engine.

a. Normal Stopping. Refer to figure 2-9 for stopping instructions.

b. Emergency Stopping. To stop the engine in an emergency, pull up on the emergency stop control.

NOTE

To restart the engine after the emergency stop control has been pulled up, push the emergency stop control down. The emergency stop control reset lever, located on left side of engine (fig. 3-2) must be pushed toward the cylinder block.



NOTE: LOAD CARRY POSITION SHOULD BE 20-24 INCHES ABOVE THE GROUND TO THE HEEL OF FORKS AND 21-23 INCHES FROM TREAD OF FRONT TIRE TO THE HEEL OF FORKS. INNER AND OUTER BOOM SHOULD BE MARKED AT THIS POINT FOR QUICK OPERATOR REFERENCE.

STEP 1: START ENGINE (REF. PARA. 2-3).

STEP 2: PULL FORK LIFT CONTROL LEVER TO RAISE FORKS 12 TO 18 INCHES OFF OPERATING SURFACE.

STEP 3: PLACE DRIVE SELECTOR LEVER (LOCATED TO REAR OF PARKING BRAKE) IN TWO-WHEEL DRIVE POSITION.

STEP 4: DISENGAGE PARKING BRAKE AND APPLY SERVICE BRAKES.

STEP 5: PLACE TRANSMISSION SPEED CONTROL LEVER IN DESIRED POSITION, DEPENDING ON WEIGHT OF LOAD. PLACE FORWARD-NEUTRAL-REVERSE CONTROL LEVER IN DESIRED POSITION.

STEP 6: RELEASE SERVICE BRAKES.

STEP 7: PRESS ACCELERATOR PEDAL AND PROCEED.

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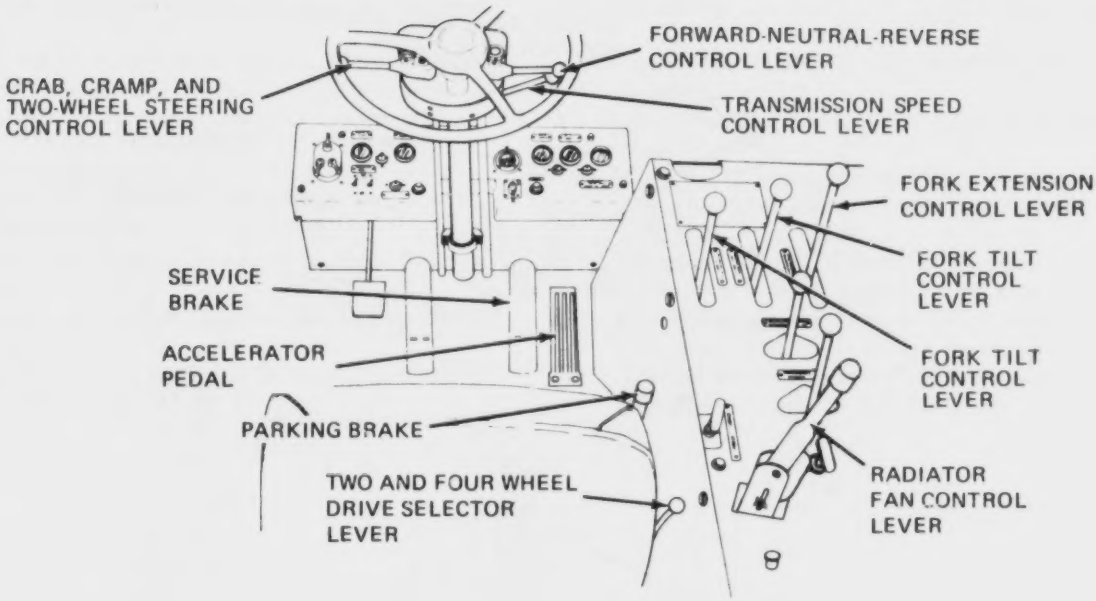
Figure 2-3. Driving on improved surfaces.



NOTE:	MAKE SURE FLYWHEEL HOUSING DRAIN PLUG IS IN PLACE, AND START ENGINE (FIG. 2-2).
STEP 1:	PULL FORK LIFT CONTROL LEVER TO RAISE FORKS APPROXIMATELY ONE-HALF MAXIMUM HEIGHT.
NOTE:	IF TRANSPORTING A LOAD, PULL FORK EXTENSION CONTROL LEVER BACK TO RETRACT LOAD AS CLOSE TO CENTER OF TRUCK AS POSSIBLE TO BALANCE LOAD.
STEP 2:	PLACE DRIVE SELECTOR LEVER (LOCATED TO REAR OF PARKING BRAKE) IN FOUR-WHEEL DRIVE POSITION.
STEP 3:	RELEASE PARKING BRAKE AND APPLY SERVICE BRAKES.
STEP 4:	PLACE TRANSMISSION SPEED CONTROL LEVER IN DESIRED POSITION. NORMALLY A LOW-SPEED POSITION IS REQUIRED FOR SURF OPERATION.
STEP 5:	PLACE FORWARD-NEUTRAL-REVERSE CONTROL LEVER IN POSITION FOR DESIRED DIRECTION OF TRAVEL.
STEP 6:	RELEASE SERVICE BRAKE, PRESS ACCELERATOR PEDAL AND PROCEED.
NOTE:	JUST BEFORE ENTERING SURF, PLACE RADIATOR FAN CONTROL LEVER IN OFF POSITION. WHEN LEAVING SURF, PLACE RADIATOR FAN CONTROL LEVER IN ON POSITION.
NOTE:	UPON ENTERING SURF AND DURING FORDING OPERATIONS, MOVE DIAGONALLY INTO WAVES.
CAUTION:	DO NOT ALLOW WATER TO EXCEED 5-FOOT LEVEL MARK, MEASURED FROM CREST OF WAVES. PROCEED SLOWLY THROUGH SURF, KEEPING CONSTANTLY ALERT FOR HOLES AND OCEAN BOTTOM SOFTNESS. WHEN TIDE IS OUT, BOTTOM IS ESPECIALLY SOFT. IF TRUCK BEGINS TO MIRE, DO NOT STOP; MANEUVER UNTIL FREE.
STEP 7:	OBSERVE RAMP OF LANDING CRAFT BEFORE ENTERING. ENTER FROM CENTER OF RAMP ON WAVE RATHER THAN BETWEEN WAVES TO COMPENSATE FOR SHIFTING. KEEP SIGHT ON TOP OF LEFT FORK. USE FORK TILT CONTROL LEVER TO BALANCE LOAD WHEN GOING UP OR DOWN RAMP.
CAUTION:	BRAKES ARE LESS EFFECTIVE IMMEDIATELY AFTER LEAVING SURF.
STEP 8:	IF CONDITIONS WARRANT THE USE OF FOUR-WHEEL STEERING, ALINE FRONT WHEELS, PLACE FORWARD-NEUTRAL-REVERSE CONTROL LEVER IN FORWARD POSITION, AND PLACE CRAB AND CRAMP CONTROL LEVER IN DESIRED POSITION.
NOTE:	CRAMPING IS NOT RECOMMENDED FOR SOFT TERRAIN.
NOTE:	AFTER OPERATION IN SURF, SEE LO10-3930-634-12-1, NOTE 6.

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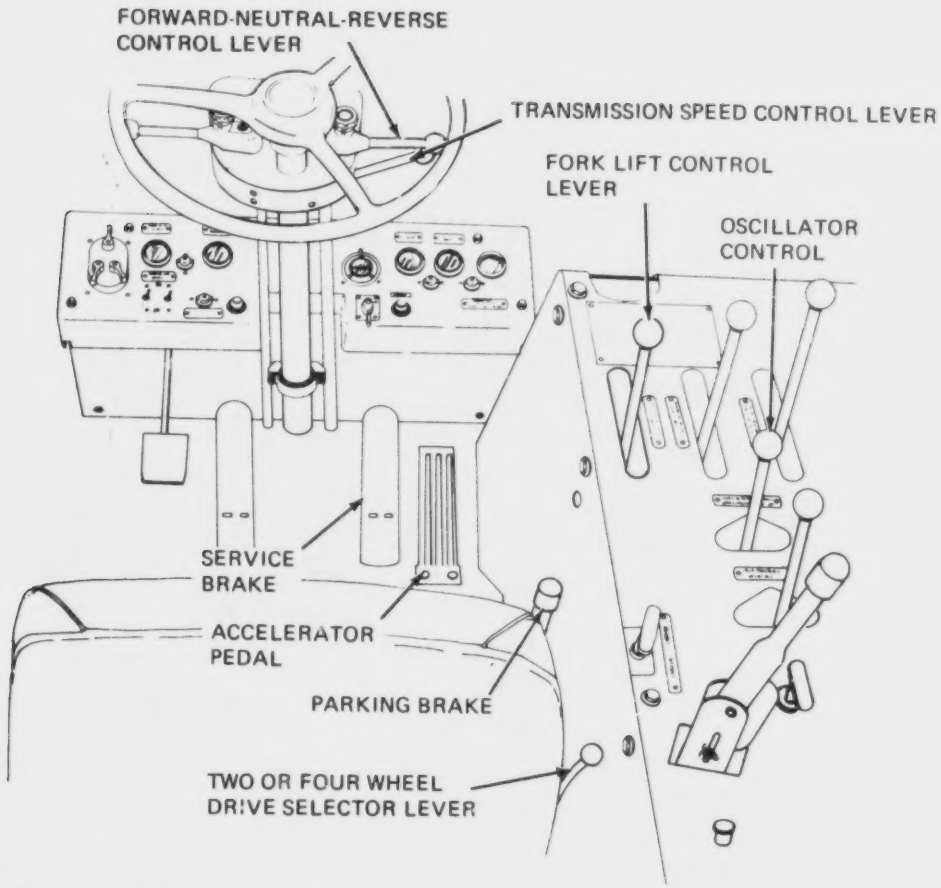
Figure 2-4. Driving in surf.



NOTE: START ENGINE (FIG. 2-2).

STEP 1: PULL FORK LIFT CONTROL LEVER TO RAISE FORKS 12 TO 18 INCHES ABOVE OPERATING SURFACE.

STEP 2: PLACE DRIVE SELECTOR LEVER (LOCATED TO REAR OF PARKING BRAKE) IN FOUR-WHEEL DRIVE.

STEP 3: RELEASE PARKING BRAKE AND APPLY SERVICE BRAKE.

STEP 4: PLACE TRANSMISSION SPEED CONTROL LEVER IN POSITION FOR DESIRED SPEED, DEPENDING ON WEIGHT OF LOAD AND TERRAIN CONDITIONS.

STEP 5: PLACE FORWARD-NEUTRAL-REVERSE CONTROL LEVER IN POSITION FOR DESIRED DIRECTION OF TRAVEL.

STEP 6: RELEASE SERVICE BRAKE, PRESS ACCELERATOR PEDAL AND PROCEED.

NOTE: DRIVE IN TRACKS ALREADY MADE IF FEASIBLE.

STEP 7: IF FEASIBLE, APPROACH SAND DUNES DIRECLY (AT RIGHT ANGLES). ATTEMPTS TO SCALE AN INCLINE SIDEWAYS AND UPWARD USUALLY RESULT IN DOWNWARD SLIPPAGE. IF A DIRECT APPROACH CANNOT BE MADE, USE THE OSCILLATION CONTROL LEVER TO BALANCE LOAD DURING THE ASCENT.

CAUTION: DO NOT ATTEMPT TO CROSS A SLOPE OF 30° OR MORE BECAUSE THE TRUCK MAY OVERTURN.

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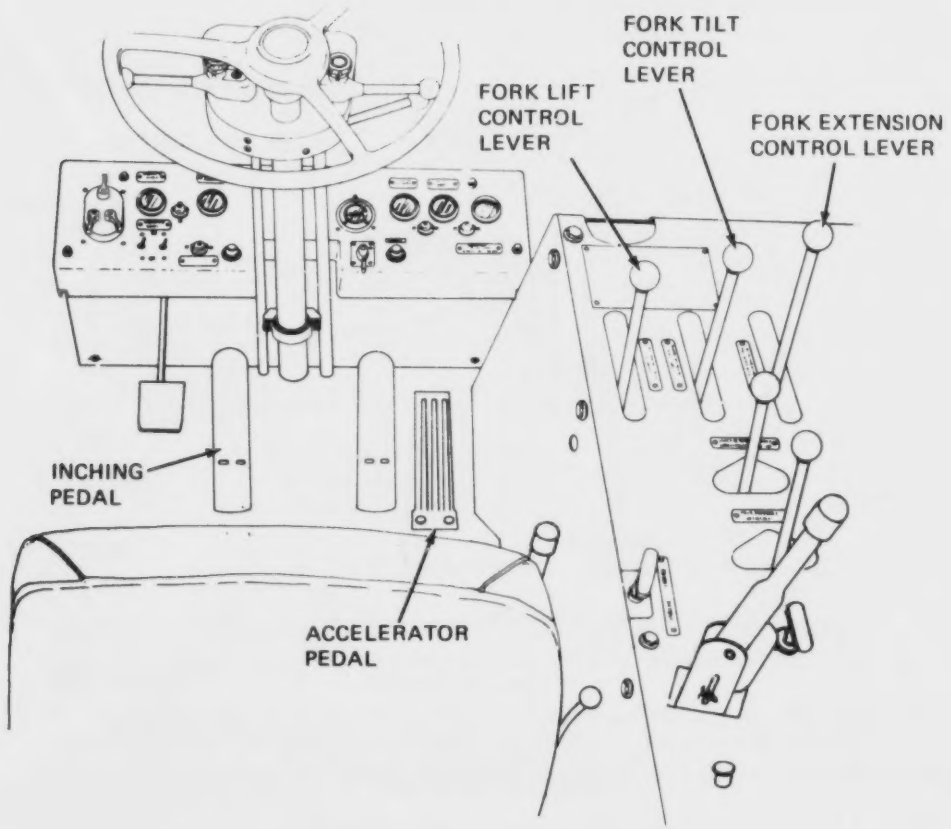
Figure 2-5. Driving in sand or snow.



STEP 1: APPROACH LOAD SQUARELY WITH LIFT FORKS AT CORRECT HEIGHT AND SPACED TO DIVIDE LOAD EVENLY. BE SURE LOCK ASSEMBLIES ARE SECURE IN THE CHAIN, AND THAT THE SPECIAL LOCK HANDLES ARE IN THE LOCKED POSITION.

STEP 2: DEPRESS INCHING PEDAL ABOUT HALFWAY TO MOVE FORWARD SLOWLY UNTIL LIFT FORKS ARE COMPLETELY UNDER LOAD.

STEP 3: DEPRESS INCHING PEDAL FULLY TO NEUTRALIZE TRANSMISSION.

STEP 4: ACCELERATE ENGINE SLIGHTLY, NOT MORE THAN 1/2 THROTTLE OR APPROXIMATELY 1500 RPM.

STEP 5: PULL BACK FORK LIFT CONTROL LEVER AND PICK UP LOAD.

STEP 6: PULL BACK FORK TILT CONTROL LEVER TO TILT LOAD AND PREVENT ITS SLIPPING FROM LIFT FORKS.

STEP 7: PULL BACK FORK EXTENSION CONTROL LEVER TO RETRACT LOAD TO CARRY POSITION AND BETTER BALANCE TRUCK.

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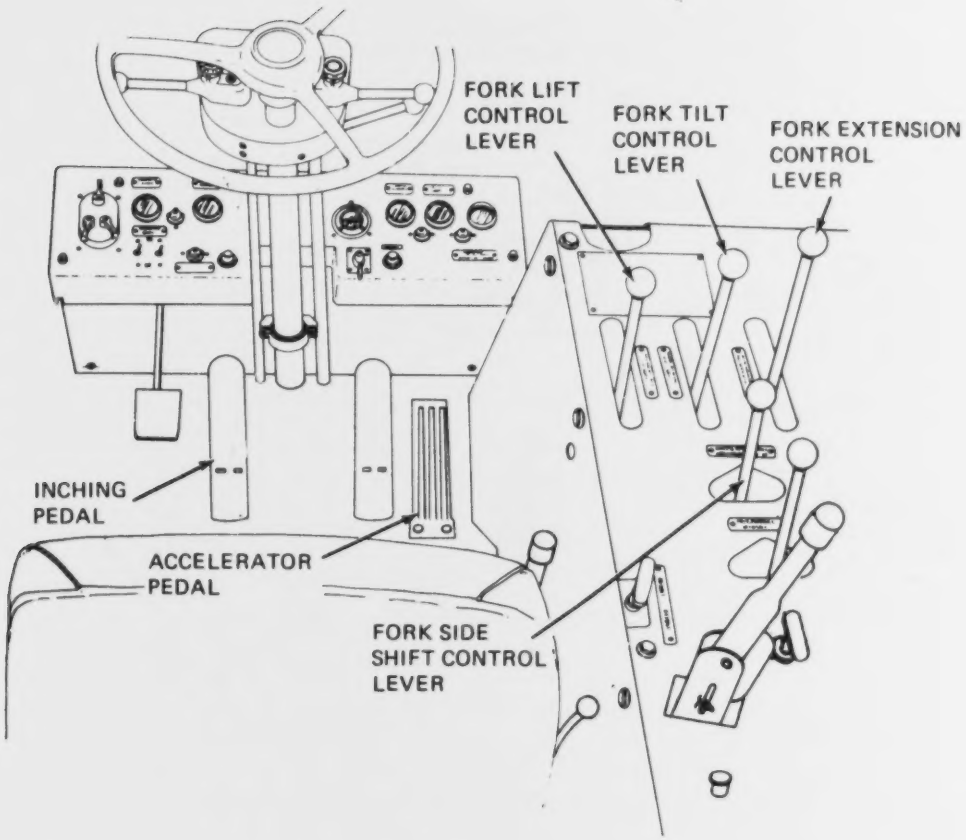
Figure 2-6. Picking up load on improved surfaces.



STEP 1: APPROACH LOAD SQUARELY AND STOP TRUCK (FIG. 2-9), LEAVING AMPLE ROOM TO MAKE FORK ADJUSTMENTS.

STEP 2: PUSH FORK EXTENSION CONTROL LEVER FORWARD TO EXTEND FORKS LONGITUDINALLY.

STEP 3: PUSH FORK TILT CONTROL LEVER FORWARD TO TILT FORK CARRIAGE TO VERTICAL POSITION.

STEP 4: PUSH FORK LIFT CONTROL LEVER FORWARD AND LOWER FORKS TO CORRECT HEIGHT. SEE THAT FORKS ARE SPACED TO DIVIDE LOAD EVENLY. IF NECESSARY, USE FORK SIDE SHIFT CONTROL LEVER TO PROPERLY POSITION FORKS FROM SIDE TO SIDE.

STEP 5: DEPRESS INCHING PEDAL ABOUT HALFWAY TO DRIVE TRUCK FORWARD SLOWLY UNTIL FORKS ARE COMPLETELY UNDER LOAD.

STEP 6: DEPRESS INCHING PEDAL FULLY TO NEUTRALIZE THE TRANSMISSION AND ACCELERATE THE ENGINE NOT MORE THAN 1/2 THROTTLE OR APPROXIMATELY 1500 RPM.

STEP 7: PULL BACK FORK LIFT CONTROL LEVER AND PICK UP LOAD.

STEP 8: PULL BACK FORK TILT CONTROL LEVER TO TILT LOAD AND PREVENT ITS SLIPPING FROM FORKS.

STEP 9: PULL BACK FORK EXTENSION CONTROL LEVER TO RETRACT LOAD TO CARRY POSITION AND BETTER BALANCE TRUCK.

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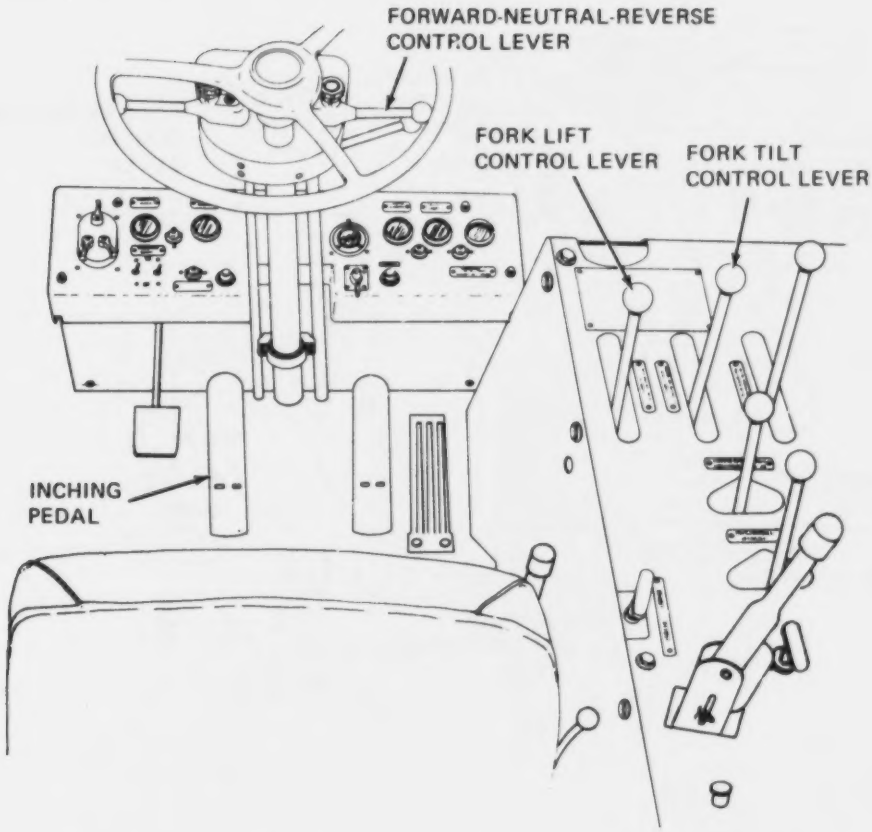
Figure 2-7. Picking up load on unimproved surfaces.



STEP 1: CAREFULLY DRIVE UP TO POSITION WHERE LOAD IS TO BE DEPOSITED.

STEP 2: DEPRESS INCHING PEDAL.

STEP 3: PUSH FORK EXTENSION CONTROL LEVER FORWARD TO EXTEND FORKS LONGITUDINALLY.

STEP 4: PUSH FORK TILT CONTROL LEVER FORWARD TO TILT CARRIAGE TO VERTICAL POSITION.

STEP 5: IF LOAD IS TO BE DEPOSITED ON GROUND LEVEL, PUSH FORK LIFT CONTROL LEVER FORWARD AND ALLOW LOAD TO LOWER SLOWLY TO RESTING PLACE. CONTINUE TO LOWER FORKS UNTIL THEY CAN BE EASILY WITHDRAWN FROM PALLET. THEN PROCEED WITH STEP 10.

STEP 6: IF LOAD IS TO BE DEPOSITED ON A TIERED STACK, PULL FORK LIFT CONTROL LEVER BACK UNTIL LOAD REACHES DESIRED HEIGHT ABOVE TIER, THEN PROCEED WITH STEPS 7 THROUGH 10.

STEP 7: RELEASE INCHING PEDAL ABOUT HALFWAY AND INCH TRUCK FORWARD UNTIL LOAD IS ABOVE ITS RESTING PLACE.

STEP 8: DEPRESS INCHING PEDAL.

STEP 9: PUSH FORK LIFT CONTROL LEVER FORWARD AND LOWER LOAD CAREFULLY TO ITS RESTING PLACE. CONTINUE TO LOWER FORKS UNTIL THEY CAN BE EASILY WITHDRAWN FROM PALLET.

STEP 10: PLACE FORWARD-NEUTRAL-REVERSE CONTROL LEVER IN REVERSE AND RELEASE INCHING PEDAL.

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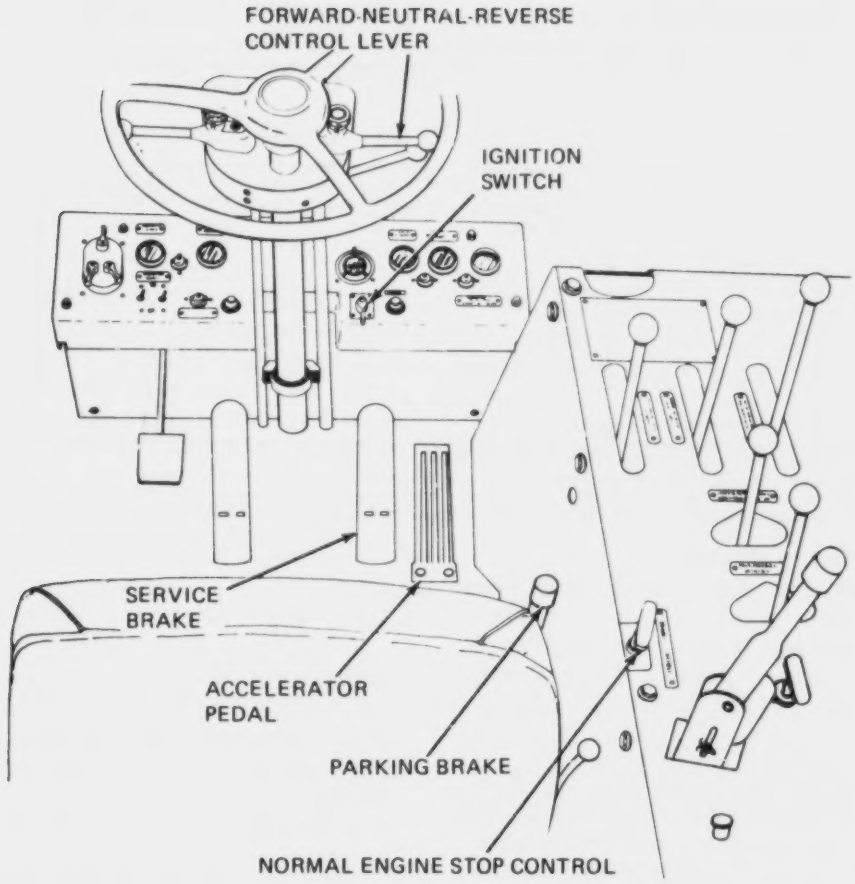
Figure 2-8. Depositing load.



STEP 1: REMOVE FOOT FROM ACCELERATOR.
STEP 2: DEPRESS BRAKE PEDAL SLOWLY AND BRING TRUCK TO GRADUAL STOP.
STEP 3: PLACE FORWARD-NEUTRAL-REVERSE CONTROL LEVER IN NEUTRAL POSITION.
STEP 4: IF TRUCK IS TO BE PARKED, APPLY PARKING BRAKE AND PULL UP ON NORMAL ENGINE SHUTOFF HANDLE.
STEP 5: TURN OFF IGNITION SWITCH.

TA031834

Figure 2-9. Forklift stopping instructions.

Section II. OPERATION UNDER UNUSUAL CONDITIONS

2-6. Operation in Extreme Cold (Below 0°F. (-18°C))

a. See that antifreeze solution is correct for lowest temperature expected (table 2-1).

b. Inspect cooling system. Correct or report any leaks.

c. Keep batteries fully charged. After adding distilled water to the batteries, run the engine for at least one hour.

d. Keep fuel tank full when not in operation.

e. Drain and service fuel filter (para 4-22).

f. Lubricate in accordance with current lubrication order.

g. Pull up on ether primer button, engage starter and, with the engine turning, press the ether button down. If combustion does not occur, repeat the priming process with the starter engaged.

h. In extremely cold weather, it is advisable to give

the engine one priming charge before engaging the starter. Then proceed as in *g* above.

i Allow engine to reach normal operating tem perature before applying load.

Table 2-1. Freezing Points, Composition and Specific Gravities of Military Antifreeze Material

Lowest expected ambient temp. °F.	Pints of inhibited glycol per gallon of coolant [1]	Compound, Antifreeze	Ethylene glycol coolant solution specific gravity at 68 F. [3]
+20	1½	Issued full strength and ready mixed for 0 to —65° F temperatures for both installation and losses.	1.022
+10	2		1.036
0	2¾		1.047
—10	3¼		1.055
—20	3½		1.062
—30	4		1.067
—40	4½		1.073
—50	Arctic		
—60	anti-freeze		
—75	preferred		

[1] Maximum protection is obtained at 60 percent by volume (4.8 pints of ethylene glycol per gallon of solution).

[2] Military Specification MIL-C-11755 Arctic type, non-volatile antifreeze compound is intended for use in the cooling system of liquid cooled internal combustion engines. It is used for protection against freezing primarily in Arctic regions where the ambient temperature remains for extended periods of time close to —40 °F., or below, to as low as —90° F.

[3] Use an accurate hydrometer. To test hydrometer, use 1 part ethylene glycol type antifreeze to 2 parts water. This should produce hydrometer reading of 0° F.

2-7. Ether Priming System

a. General. The ether primer is a pressurized system used to inject a highly volatile fluid into the engine air intake system. This is to facilitate starting when ambient temperatures are below 40°F. The replaceable pressurized cylinder contains sufficient fluid for 75 to 150 starts.

b. Operating the Ether Priming System.

(1) Pull up on the ether primer button for about 2 seconds. Wait 3 seconds, then crank engine. With engine turning, push the ether primer button down.

(2) Perform normal starting procedures (para. 2-3).

(3) If engine fails to start, refer to troubleshooting chart.

2-8. Operation in Extreme Heat

WARNING

Be extremely careful when removing the radiator filler cap of a hot engine. Release of pressure may cause violent boiling and serious injury to personnel.

a. Insure that radiator filler cap seals properly. The boiling point of the coolant is raised as the system pressure is increased.

b. Check coolant level frequently. Add coolant as necessary. Use standard ethylene glycol mixture as specified in table 2-1.

c. Remove all obstructions and foreign material collected on radiator fins and air passages.

d. Do not overfill fuel tank. Make sure fuel filters are clean.

e. Make sure air cleaner is cleaned and serviced (para. 3-8).

2-9. Operation in Dusty or Sandy Area

a. Clean all grease fittings.

b. Lubricate in accordance with current lubricatio order.

c. Change engine oil and oil filter frequently.

d. Service air cleaner (para. 3-8) often to give th engine proper air intake.

e. Clean and service fuel filters (para. 4-22).

2-10. Operation in Salt Water Area

a. Keep all lubricating points wiped clean and we lubricated.

b. Keep all wiring and ignition terminals free of co rosion.

c. Keep forklift truck as clean as possible.

d. After operation is complete, wash truck with fres water. Lubricate in accordance with lubrication orde Check all gear cases for water contamination. If con tamination is found (evidenced by milky color of lubri cant), drain, flush and refill.

2-11. Operation Under Rainy or Humi Conditions

a. Keep fuel tank full at all times.

b. After operation, wash forklift truck to remov mud.

2-12. Operation at High Altitude

a. Keep a constant watch on the coolant level. Ad coolant as necessary.

NOTE

The engine will operate with less performance at high altitudes.

b. During operation, keep close watch on engine in struments.

2-13. Operation in Snow

a. Keep fuel tank full at all times. Use precaution t keep snow away from filler when servicing fuel tank

b. Clean all snow from operating controls.

c. Clean all snow from steps.

CHAPTER 3
OPERATOR/CREW MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. General Lubrication Information

This section contains information on lubrication instructions not covered in the current lubrication order. Refer to the current lubrication order for all other lubrication instructions.

3-2. Detailed Lubrication Information

a. Care of Lubricants. Keep all lubricants in closed containers and store in a clean, dry place away from heat. Keep container cover clean and in good repair. Keep dust, dirt and all other foreign material out of the lubricant. Keep all lubrication equipment clean and ready for use.

b. Cleaning. Keep all external parts that do not require lubrication free of lubricants. Wipe all lubrication points clean before lubricating the equipment. Clean all lubrication points of excessive lubricants after servicing to prevent a buildup or accumulation of foreign matter.

CAUTION

Overlubrication may cause equipment failure or damage to working parts.

c. Points of Lubrication. Service the lubrication points at the intervals described in the current lubrication order.

d. Intervals of Lubrication. The intervals of lubrication specified in the lubrication order are based on operation under normal conditions. Modification of the recommended intervals may be required under unusual operating conditions.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-3. General

To insure that the forklift is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in paragraph 3-4. Defects discovered during operation of the unit shall be noted for future correction to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded, together with the corrective action taken, on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest possible opportunity.

3-4. Preventive Maintenance Checks and Services

Preventive maintenance checks and services are listed in tables 3-1 and 3-2. These services must be performed by the operator/crew at the intervals and sequences indicated in the tables.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services

B—Before Operation Time required: 0.9
D—During Operation
A—After Operation Time required: 0

Interval and sequence no. B	D	A	Item to be Inspected Procedure	Work time (man-hour)
1			See that the fork lift truck has been serviced in accordance with current lubrication order.	0.1
2			FIRE EXTINGUISHER Inspect for broken seal.	0.1
3			TIRES Check for proper inflation (45 psi for front tires and 35 psi for rear tires).	0.1
4			LIGHTS Inspect all for loose or damaged cables, mountings, or lenses and check for proper operation.	0.1
5			FUEL TANK Add fuel as required. Clean filter strainer as required.	0.1
6			RADIATOR Inspect for proper coolant level (1½ inches below filler neck)	0.1
7			FUEL FILTERS Drain enough fuel from strainer and filter to insure elimination of water and foreign particles.	0.1
8			BELTS Inspect for excessive wear, damage and proper tension (½ to ¾ inch deflection midway between the pulleys)	0.1
9			HYDRAULIC SYSTEM Check oil level and contamination. Check cylinders, hoses, and fittings for evidence of leaks.	0.1

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services — Continued

B—Before Operation Time required: 0.04 | D—During Operation | A—After Operation Time required: 0

Interval and sequence no.			Item to be Inspected Procedure	Work t (man-h
B	D	A		
10	12		ELECTRICAL SYSTEM Check generator and regulator, starter and lights for proper operation. Tighten loose connections, replace defective wiring.	0.1
	11		INSTRUMENTS Inspect for proper operation and secure mounting. Normal readings are: Coolant temperature ..... 170° — 220° F Engine oil pressure (normal) ..... 40 — 60 psi Engine oil pressure (low idle) ..... 8 — 15 psi Battery-regulator indicator ..... Green area	0.1
			Torque converter pressure ..... 240 — 280 psi	0.1
	13		HOURMETER Check for proper operation.	0.1
	14		CONTROLS Check controls for freedom of movement and proper operation.	0.1

CAUTION

Do not operate the forklift truck without the engine side panels installed.

Table 3-2. Operator/Crew Preventive Maintenance Checks and Services

D—Daily Operation Time required: 0.0 | W—Weekly Opera Time required

Interval and sequence no.		Item to be inspected procedure	Work time (M H
D	W		
	1	FUEL SYSTEM Clean primary fuel filter, check fuel pump and correct fuel leaks. Replace secondary fuel filter quarterly.	0.1
	2	BATTERIES Check electrolyte level. Fill to ½ inch above the plates with distilled water. In freezing weather, run engine at least one hour after adding water to batteries. Check connection and terminals. Refer to TM 9-6140-200-15.	0.1
	3	AIR CLEANER Check restriction indicator and service the air cleaner as necessary.	0.4
	4	CHAINS AND SPROCKETS Inspect chain and sprockets for excessive wear. Check chain tension for minimal deflection midway between sprockets, not more than ½ inch.	0.1

Section III. TROUBLESHOOTING

3-5. General

This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the 6,000 lb. forklift truck, Army Model MHE-230. Each malfunction for an individual component, unit or system is followed by a list of tests or inspections. The tests and inspections help to determine probable causes and corrective actions to be taken. Perform the tests/inspections and corrective tions in the order listed.

3-6. Limitations

This manual cannot list all malfunctions that can cur, nor list all tests/inspections and corrective actio Notify your supervisor when malfunctions occur t are not covered in the troubleshooting table 3-3.

Table 3-3. Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. ENGINE FAILS TO START
Step 1. Check for loose, corroded or damaged battery cables and connections.
Clean corroded cables. Tighten loose connections and report damaged cables to organizational maintenance.
Step 2. Check for empty fuel tank.
Service tanks as necessary.
2. ENGINE OPERATES ERRATICALLY
Step 1. Check for clogged air cleaner.
Service air cleaner (para 3-8).
Step 2. Check for condensation and fuel contamination.
Drain condensation from fuel filters before starting engine. Report evidence of fuel contamination to organizational maintenance.
3. ENGINE LACKS POWER
Check for clogged air cleaner.
Service the air cleaner (para 3-8).
4. ENGINE OVERHEATS
Step 1. Check radiator for lack of coolant.
Allow engine to cool and service with coolant.
Step 2. Check fan belt for looseness.
Report loose or damaged fan belts to organizational maintenance.
5. ENGINE EXHAUST SMOKE EXCESSIVE
Check for clogged air cleaner.
Service the air cleaner (para 3-8).
6. ENGINE OIL CONSUMPTION EXCESSIVE
Inspect engine compartment for oil leaks.
Do not continue operation if oil leak is likely to reduce engine oil below the safe operating level.
7. STEERING ERRATIC
Step 1. Check for rear steering cross-shaft binding in tube.
Do not continue operation if the erratic steering constitutes a threat to personnel safety or may result in equipment damage.
Step 2. Check for low level of hydraulic fluid.
Report low hydraulic fluid level to organizational maintenance.
8. BATTERY FAILS TO MAINTAIN CHARGE
Step 1. Check for low level of electrolyte.
Service battery with distilled water.
Step 2. Visually inspect battery for damage such as loose terminal posts or warped internal plates.
Report unserviceable batteries to organizational maintenance.

Section IV. OPERATOR/CREW MAINTENANCE PROCEDURES

3-7. Oil Filler Pipe and Cap

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. — 138°F.

a. Cleaning. Remove left engine side panel for access to oil filler pipe and cap. Clean pipe and cap (fig. 4-4) with an approved cleaning solvent.

b. Inspection. Inspect cap for deterioration. Replace defective or damaged seal. Inspect filler pipe for cracks.

3-8. Engine Air Cleaner

a. Inspection. Unhook three latches and remove the cup. Remove the elements and inspect for excessive accumulation of dirt. Remove the cup dust trap and inspect for excessive accumulation of dust. Check air filter restriction indicator for normal reading.

b. Service. Refer to figure 3-1 and service the air cleaner.

c. General. When the air cleaner restriction indicator is red, servicing of the primary filter is required.

(1) *Removal.* Remove the air cleaner filter elements as shown in figure 3-1.

(2) *Cleaning.*

(*a*) The primary filter element can be cleaned by either reverse flushing with compressed air or by washing in water. Compressed air is recommended when the element is to be reused immediately. An element that has been washed in water should be dried thoroughly before reuse. Water is a better cleaning agent and should be used when soot or oil has plugged the element. The filter element should be replaced after six cleanings or annually, whichever occurs first. The safety filter element must be replaced at every third primary element service.

NOTE

The safety filter element should not be cleaned and reused.

(*b*) When using compressed air, direct the air from the element to the outside, being careful not to rupture the element. Be sure that the O-ring is properly sealed and that no leaks exist. Be sure that the filter restriction indicator reads in green with the engine running.

(*c*) When using water to clean the element, soak in a detergent and water for at least 15 minutes. Rinse with a hose until water runs clean. The maximum allowable water pressure is 40 psi.

(*d*) Allow the element to dry thoroughly be using. Do not use compressed air or light bulbs to d wet element.

(3) *Inspection.*

(*a*) Inspect the filter element by placing a br light inside and rotating the element slowly. If rupture or holes are discovered, replace element.

(*b*) Inspect the air cleaner body, inlet stack rain cap for damage. Replace defective parts.

(4) *Installation.* Refer to figure 3-1 and rein the air cleaner filter elements. Reset the restrictio dicator to green.

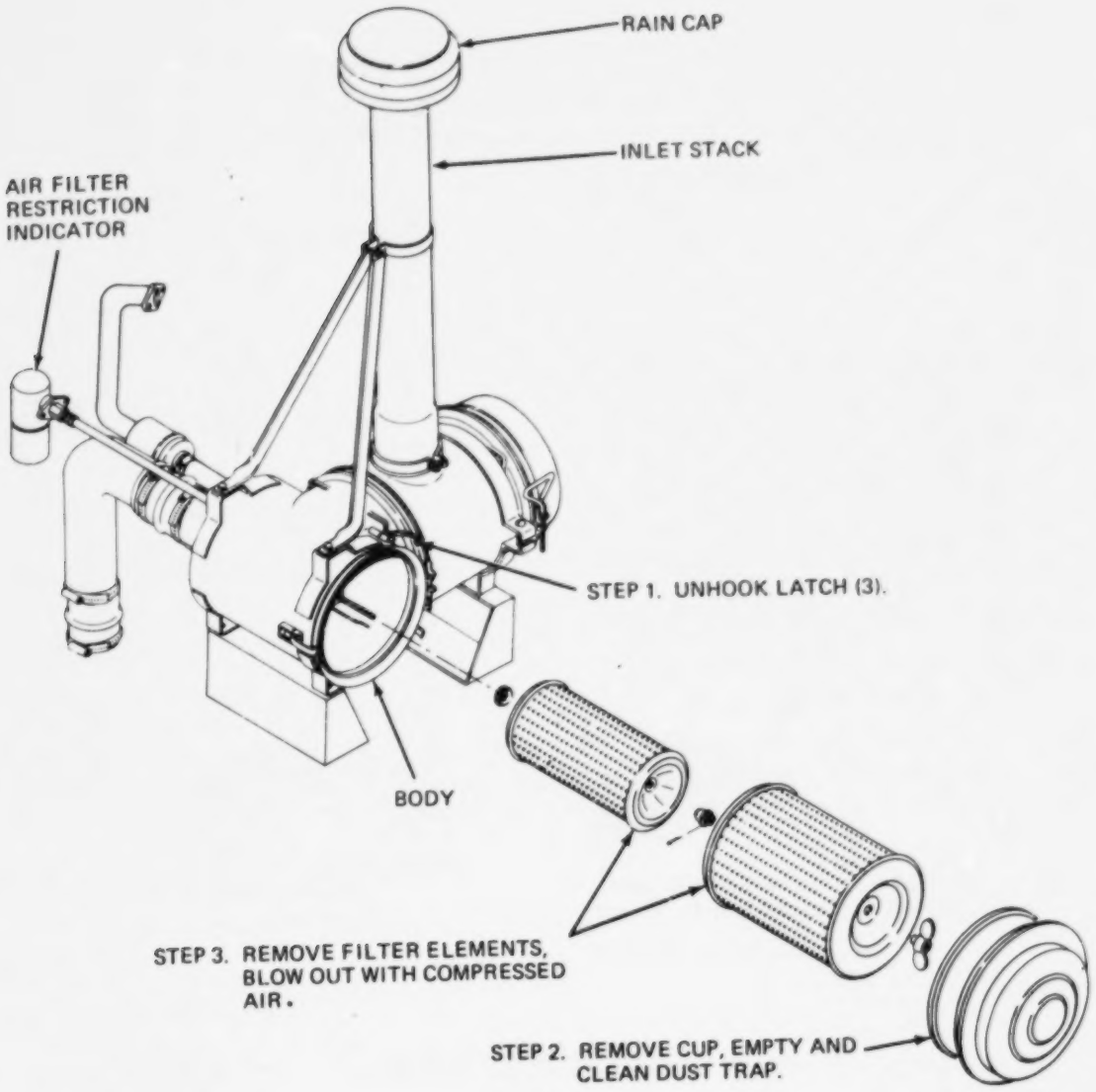

RAIN CAP
INLET STACK
AIR FILTER RESTRICTION INDICATOR
STEP 1. UNHOOK LATCH (3).
BODY
STEP 3. REMOVE FILTER ELEMENTS, BLOW OUT WITH COMPRESSED AIR.
STEP 2. REMOVE CUP, EMPTY AND CLEAN DUST TRAP.
NOTE: AFTER SERVICE, REINSTALL FILTER ELEMENTS, REINSTALL CUP AND HOOK LATCH (3).
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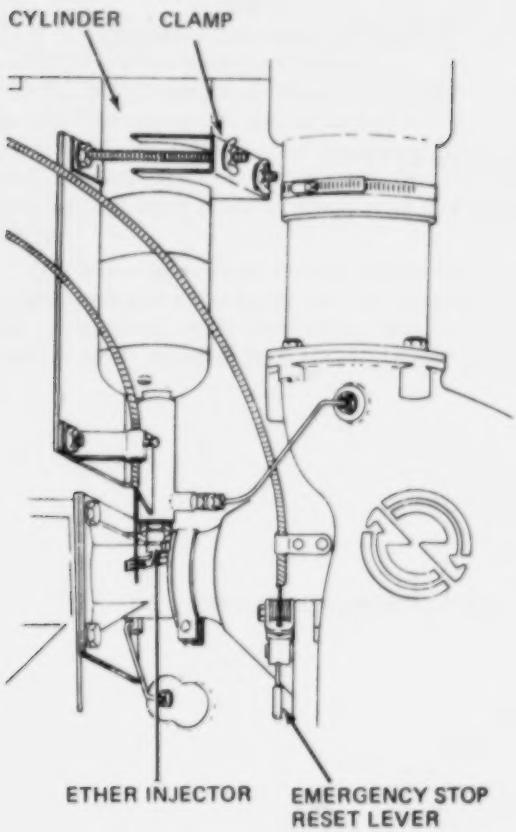
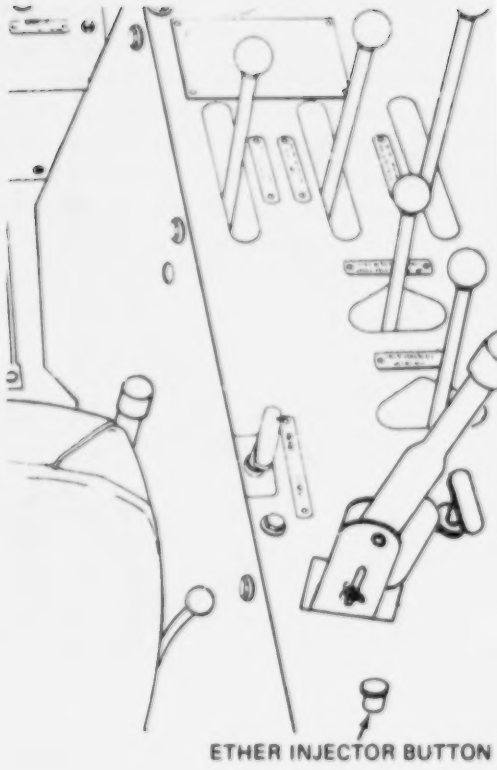
Figure 3-1. Air cleaner service.

3-9. Ether Primer Servicing

Remove left engine side panel for access to the ether primer. Refer to figure 3-2 and service the ether primer.





STEP 1. REMOVE CAP.
STEP 2. PLACE ETHER CYLINDER IN ETHER INJECTOR AND SECURE WITH CLAMP.

STEP 3. PULL ETHER INJECTOR BUTTON FOR DESIRED AMOUNT FOR COLD WEATHE STARTING.

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Figure 3-2. Ether primer service.

3-10. Water Pump Inspection

Remove right engine side panel for access to water pump. Check water pump (fig. 4-11) for leaks, excessive end play and noise. Check drive belt tensions.

3-11. Fan Pulley Inspection

Remove engine side panels and check pulley and hub for cracks, breaks, loose or missing parts or other damage (fig. 3-3).

3-12. Drive Belt Inspection

a. Remove engine side panels for access to drive belts.

b. Check belt tension by placing a straight edge on the rims of the pulleys. Belt deflection of one-half inch midway between pulleys is evidence of correct belt tension.

c. Fan drive belt adjustment (figure 3-3A).

(1) Loosen three bolts mounting the adjus bracket.

(2) Move bracket up to tighten belts, or dow loosen belts.

(3) Retighten bolts to hold adjusting bracke desired position.

d. Generator drive belt adjustment (figure 3-3

(1) Loosen screw and nut holding generator to justing arm.

(2) Move generator away from engine to tigh belts, or toward the engine to loosen belts.

(3) Retighten screw and nut to hold generato desired position.

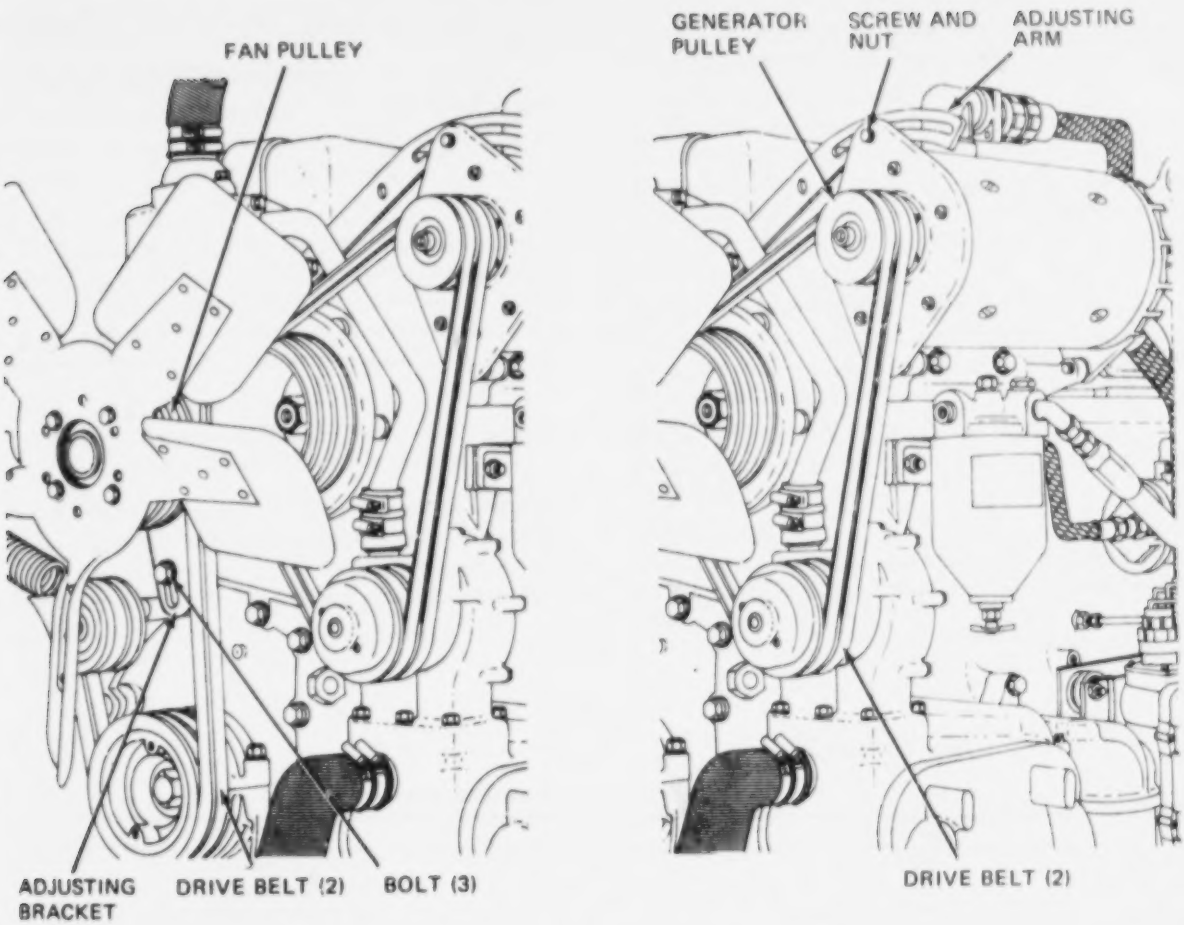


Figure 3-3. Drive belt adjustment.

3-13. Battery

Refer to figure 3-4 and visually inspect batteries for damage such as loose terminal posts or warped internal plates. Remove battery cell vent caps and check the level of the electrolyte. The liquid should be one-half inch above the plates. Replace vent caps. Inspect cables and battery holddown hardware for corrosion.

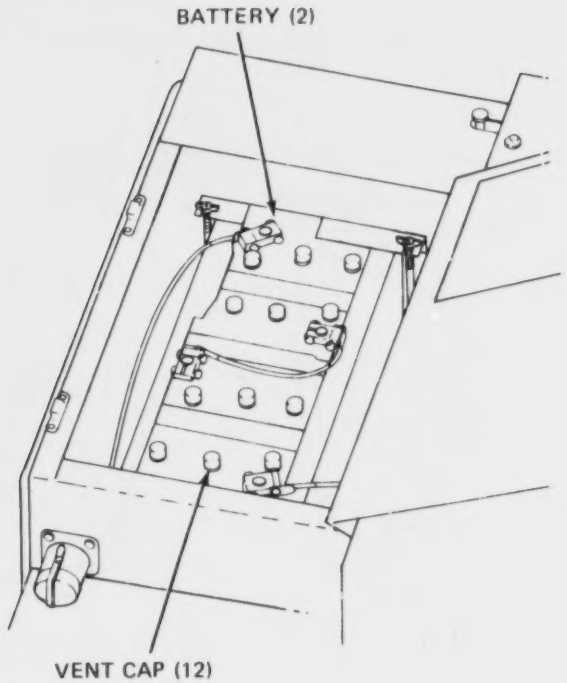


Figure 3-4. Battery.

3-14. Fuel Tank

a. Inspection. Inspect the fuel tank for de
leaks.

b. Service. Service fuel tank with diesel fuel
ing to table 3-4.

Table 3-4. Fuel Use According to Temperature

Temperature range	Fuel
+20° F and up	VVF-800 Type DF2
—25° F and up	VVF-800 Type DF1
—25° F and down	VVF-800 Type DFA

3-15. Coolant Hoses and Fittings

Refer to figure 4-12 and inspect fittings and surfaces cracks and damage. Inspect hoses for deterioration and cuts.

3-16. Exhaust Manifold Inspection

Remove engine hood and right side panel, refer to figure 3-5 and inspect exhaust manifold and flange for cracks, nicks and damaged parts.

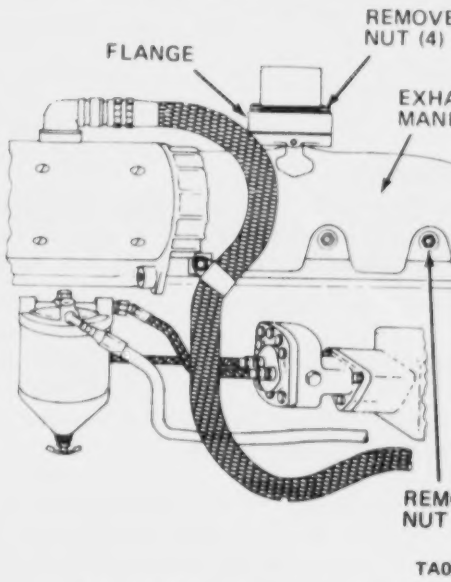


Figure 3-5. Exhaust manifold and flange.

3-17. Muffler and Exhaust Pipe Inspection
Refer to figure 4-5 and inspect muffler and exhaust pipe for cracks, dents and rust.

3-18. Radiator Service
Remove radiator cap at rear of engine hood, check coolant level, and service as necessary.

3-19. Lights
a. Inspection. Visually inspect headlights, blackout lights, stop/taillights and marker lights for operation.

b. Adjustment. Headlights and blackout lights may be adjusted to meet the lighting requirements as these requirements change with various jobs.

3-20. Tires Inspection
Inspect tires for leaks and cuts. Check wheel mounting nuts for looseness. Check for proper inflation.

3-21. Frame and Fork Carriage Inspection
Inspect frame and fork lift carriage, axle mountings, crossmembers and frame supports for cracks, breaks, or misalignment. Inspect side shift sprocket and chain for wear or damage.

3-22. Controls and Instruments
Operate the engine and check controls and instrument for proper operation and indications.

3-23. Engine Operation
Check engine for smooth operation at idle speed. After preliminary warmup period, accelerate to maximum governed speed and check engine response to acceleration. Note any erratic operation. Reduce engine speed steadily to idle and listen for unusual noise or vibration.

3-24. Hydraulic and Steering Systems
Operate engine. Check that all systems operate properly, without binding or restrictions. Check hoses and fittings for leaks or damage.

3-25. Front and Rear Drive Axles
During initial road operation, note any unusual noise coming from the axles.

3-26. Leakage.
With engine operating, inspect fuel lines, lubricating oil lines, coolant line, fuel tank, filters, radiator and engine crankcase area.

CHAPTER 4
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. Inspect New Equipment

a. Make a visual inspection to make sure that the required tools, repair parts and other "Items Troop Installed or Authorized" are included with the equipment.

b. Inspect the diesel engine and mounted components for damaged or missing items.

c. Inspect wiring, fuel and oil lines, radiator hoses, fuel and hydraulic oil tanks, hydraulic system piping, gages, instruments and lights for missing, loose, broken or damaged parts.

d. Inspect drain plugs, breathers, filters, caps, and drain cocks for improper installation and damage.

e. Inspect air and hydraulic hoses and lines and electrical leads for cuts, breaks or signs of deterioration.

f. Correct deficiencies falling within the limits of organizational maintenance.

4-2. Servicing Equipment

a. Perform daily and quarterly preventive maintenance as indicated in paragraphs 3-3 and 4-9.

b. Remove battery vent fill caps and fill each cell with electrolyte to a level ½ inch above the tops of the plate separators.

WARNING

Avoid contact with electrolyte. If electrolyte comes in contact with eyes, flush thoroughly and immediately with cold water. Do not rub. Thoroughly and immediately wash all parts of the body touched by electrolyte with cold water. If electrolyte comes in contact with fabrics, neutralize using baking soda or household ammonia, in addition to washing with cold water.

c. Replace vent caps.

d. Apply a light coating of nonmetallic grease or petroleum jelly to the battery posts. Install battery cables. Tighten the cable terminals securely.

e. Wipe the tops of the batteries and battery hold-down hardware with cloth moistened in baking soda or ammonia solution to remove any spilled acid. Wipe dry with clean cloth.

f. Make sure all drain valves on the engine and radiator are closed. Fill the cooling system with soft, clean water to a level 1½ inches below the neck of the radiator.

NOTE

When operating in freezing temperatures or below, use antifreeze in the quantities indicated in table 2-1.

Section II. MOVEMENT TO A NEW WORKSITE

4-3. Dismantling For Movement

a. Local Movement. The forklift truck does not require special treatment for local relocation as it is capable of moving short distances under its own power.

b. Shipment.

(1) *Roll over protective structure. (ROPS)*

(*a*) Depending on the mode of shipment, height requirements, route, etc., it may be necessary to remove ROPS prior to shipping.

(*b*) Refer to paragraph 4-71 and remove ROPS.

(2) *Mode of Shipment.* Either railroad flat car or lowboy trailer can be used to transport the forklift truck over long distances. Secure the forklift truck to the flat car or trailer and cover as required.

4-4. Reinstallation After Movement

If ROPS was removed prior to shipping, refer to paragraph 4-71 and reinstall ROPS after movement.

Section III. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

4-5. Tools and Equipment

Tools and equipment issued with or authorized for the forklift truck are listed in Appendix C.

4-6. Special Tools and Equipment

None required.

4-7. Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in TM 10-3930-634-20P.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (MONTHLY AND QUARTERLY)

4-8. General

To insure that the forklift truck is ready for operation at all times, it must be inspected systematically. Defects discovered in such inspections may be corrected before they result in more serious damage or failure.

4-9. Organizational Preventive Maintenance Checks and Services Chart

The necessary preventive maintenance checks and services to be performed are listed and described i 4-1.

Table 4-1. Organizational Preventive Maintenance Checks and Services (Monthly and Quarterly)

Monthly Operation
Time required: 0

Quarterly
Time r

Interval and Sequence No.		Item to be inspected Procedure
Monthly	Quarterly	
	1	FIRE EXTINGUISHER Inspect for broken seal. Check for full charge in accordance with instructions on extinguisher.
	2	CONTROL LEVERS AND PEDALS Check for proper operation. Check hydraulic pump, motors, valves, lines and fittings for leakage. Replace seals and gaskets as required.
	3	TIRES Check for proper inflation. Correct pressure is 45 psi. (front tires and 35 psi, rear tires). Replace badly cracked or worn tires.
	4	FRONT AND REAR AXLES Inspect for lubricant leaks. Check steering linkage for excessive wear.
	5	BATTERIES Check cables and holddown mountings for tightness. Remove as necessary, any verdigris or other contamination from clamps, cables and posts. Inspect for cracks and leaks. Fill to ½ inch above the plates. Clean vent holes in caps in freezing weather, run engine at least one hour after adding water.
	6	FUEL TANK Add fuel as necessary. Tighten loose mountings and leaking lines. Replace defective cap gasket.
	7	FUEL SYSTEM Clean primary fuel filter. Check fuel pump and correct fuel leaks. Replace secondary filter.
	8	LUBRICATION SYSTEM Add lubricating oil as necessary. Check for leaks or deterioration of hoses, lines and fittings.
	9	COOLING SYSTEM Check coolant level and services as necessary. Check for cracked or leaking hoses and replace as required. Check coolant level to be 1½ inch below filler neck.
	10	V BELTS Inspect for excessive wear, cuts, breaks and proper tension.
	11	ELECTRICAL SYSTEM Check generator, regulator, starter and lights for proper operation. Tighten loose connections, replace defective wiring.
	12	GAGES, INSTRUMENTS AND HOURMETER Check for proper operation, secure mountings and normal indications such as the following: Coolant temp. ..... 170° to 220° F Engine oil pres. (normal) ..... 40 to 60 psi Engine oil pres. (low idle) ..... 8 to 15 psi Torque converter temp. ..... 100° to 250° F Battery-regulator indicator ..... Green area Torque converter pres ..... 240 to 280 psi
	13	HYDRAULIC SYSTEM Check oil level. Check oil for contamination. Replace filter every 500 to 1,000 hour intervals. Check cylinder and hoses for leakage.
	14	CHAINS AND SPROCKETS Inspect for excessive wear and minimal deflection midway between sprockets largest span.

Section V. TROUBLESHOOTING

4-10. General

This section contains troubleshooting information for locating and correcting most of the operating malfunctions which may occur in the 6,000 lb. forklift truck, Army Model MHE-230. Each malfunction for an individual component, unit or system is followed by a list of tests or inspections. The tests and inspections help to determine probable causes and corrective action to be taken. Perform the test or inspection and take tive action in the order listed.

4-11. Limitation

This manual cannot list all malfunctions that cur, nor all tests or inspections and corrective a Notify your supervisor when malfunctions occ are not covered in the troubleshooting table 4-

Table 4-2. Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. ENGINE WILL NOT CRANK.
   - Step 1. Inspect battery connections for poor contact.
     Clean contact surfaces of battery connections, reinstall serviceable cables and replace cables damaged beyond serviceability.
   - Step 2. Inspect battery for low electrolyte.
     Add distilled water until battery plates are covered.
   - Step 3. Using a hydrometer, test the specific gravity of the electrolyte. A reading of 1,220 or lower indicates less than half charge of the battery.
     Recharge or replace the battery.
   - Step 4. Inspect starter for defective wiring.
     Replace starter.

CAUTION

Do not tow, push or attempt to push start the forklift truck. Damage to transmission bearings, steering, and wheel alignment may result.

2. ENGINE CRANKS BUT FAILS TO START.
   - Step 1. Inspect air cleaner for damage or obstruction.
     Service air cleaner or replace if damaged.
   - Step 2. Inspect fuel filters for damage or obstruction.
     Clean fuel filter or replace them if damaged.
3. ENGINE OPERATES ERRATICALLY.
   - Step 1. Inspect fuel filters for damage or obstruction.
     Clean fuel filters or replace them if damaged.
   - Step 2. Inspect air cleaner for damage or obstructions.
     Service air cleaner or replace if damaged.
4. ENGINE LACKS POWER.
   - Step 1. Inspect throttle linkage for damage, excessive wear and limited movement.
     Adjust serviceable linkage and replace damaged or excessively worn linkage.
   - Step 2. Inspect air cleaner for damage or obstruction.
     Replace damaged air cleaner or faulty air cleaner hoses.
5. ENGINE OVERHEATS.
   - Step 1. Inspect for poor coolant circulation.
     Replace faulty hoses, clamps and thermostats. Check water pump and replace if faulty.
   - Step 2. Inspect for loose, damaged or broken fan belts.
     Adjust loose fan belts, replace unserviceable belts.
6. EXCESSIVE LUBRICATING OIL CONSUMPTION.
   - Step 1. Inspect engine compartment for evidence of oil leakage.
     Replace defective or worn hoses, tubing, fittings and gaskets.
7. TRANSMISSION AND TORQUE CONVERTER OVERHEATS.
   - Step 1. Inspect for low transmission oil level.
     Service transmission according to current lubrication order.
   - Step 2. Check for loss of oil due to defective hose assemblies.
     Replace hose assemblies.
   - Step 3. Inspect for clogged or damaged filter.
     Clean or replace filter as necessary.
8. CONVERTER STALL SPEED LOW.
   - Step 1. Inspect throttle linkage for out of adjustment.
     Adjust linkages for full governor travel.
9. STEERING ERRATIC.
   - Step 1. Inspect steering cross-shaft for binding in the tube.
     Lubricate cross-shaft and all steering linkage.
   - Step 2. Check hydraulic pump for low output pressure. Take pressure reading near hydraulic pump. Pressure should be 2,000 psi at operating speed.
     Replace defective hydraulic pump.
10. BATTERIES FAIL TO MAINTAIN CHARGE.
    - Step 1. Inspect battery for shorted plates, or loose terminal posts.
      Replace shorted or unserviceable batteries.
11. BRAKES DRAGGING OR RUNNING HOT.
    - Step 1. Inspect for air in hydraulic actuating system.
      Bleed service brakes (para 4-57b)
12. BRAKES WILL NOT APPLY.
    - Step 1. Inspect for hydraulic leaks in the brake system.
      Replace defective hoses, lines, fittings and seals.

Table 4-2. Troubleshooting — Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 2. Inspect for air in hydraulic system. Bleed hydraulic brake system (para 4-57b)
13. BRAKES DO NOT RELEASE PROPERLY.
Step 1. Inspect for clogged or restricted hydraulic tank filter. Replace clogged or damaged filter.
14. LOW HYDRAULIC SYSTEM PRESSURE.
Step 1. Inspect pump drive coupling for shear damage. Replace defective pump.

Section VI. MAINTENANCE OF LUBRICATION SYSTEM

4-12. General

This section contains information on maintenance of the lubrication system, including oil filter lines and dipstick.

4-13. Oil Filter

a. Removal. Remove the right engine side panel for access to the oil filter. Refer to figure 4-1 and remove the oil filter.

b. Cleaning and Inspection.

(1) Refer to figure 4-2 to service the oil filter. Remove center stud and disassemble filter as shown.

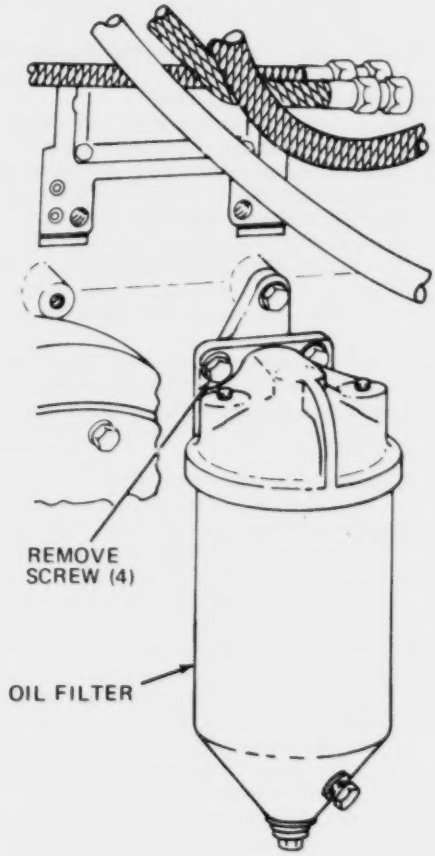
(2) Make sure gasket surface is free from old gasket material. Clean with an approved cleaning solvent and dry thoroughly.

(3) Inspect cover and mounting flange for nicks and cracks. Remove small nicks with fine sandpaper.

c. Installation. Use new gaskets, O-ring and filter element upon reassembly. Refer to figure 4-1, and reinstall four mounting screws to install oil filter.

CAUTION

Check for oil leaks when engine is started. Oil leaks may cause serious damage to the engine.



TA031840

Figure 4-1. Oil filter, removal and installation.

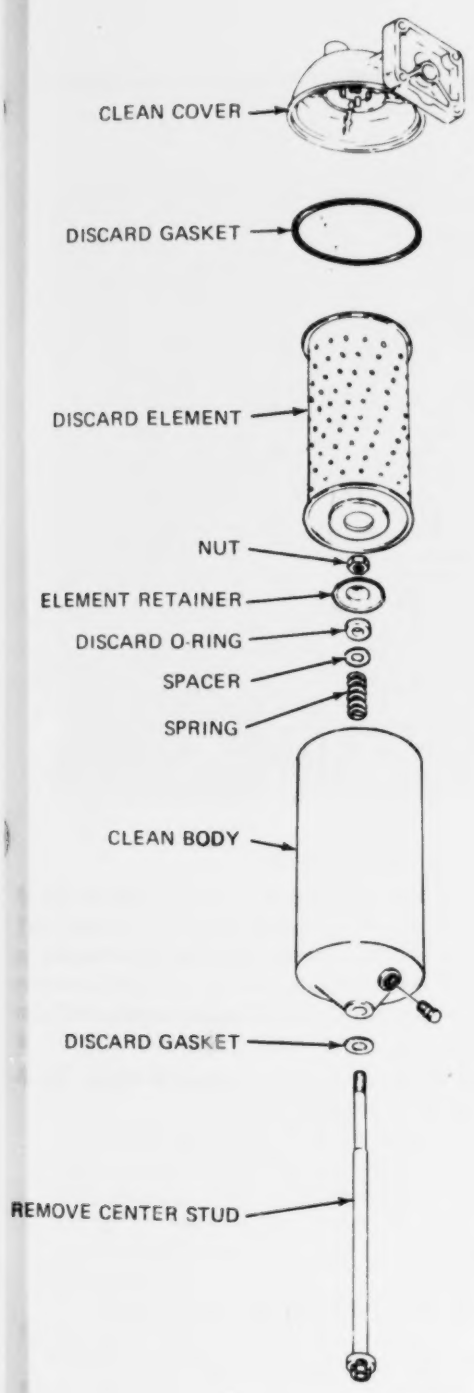


Figure 4-2. Oil filter service.

4-14. Crankcase Breather

a. Removal. Remove muffler and exhaust pipe, disconnect air cleaner hose and remove engine hood for access to the crankcase breather. Refer to figure 4-3 and remove crankcase breather.

b. Cleaning and Inspection.

(1) Wash the crankcase breather inside with an approved cleaning solvent. Dry with compressed air.

(2) Inspect crankcase breather for cracks and bends.

c. Installation. Refer to figure 4-3 and install crankcase breather.

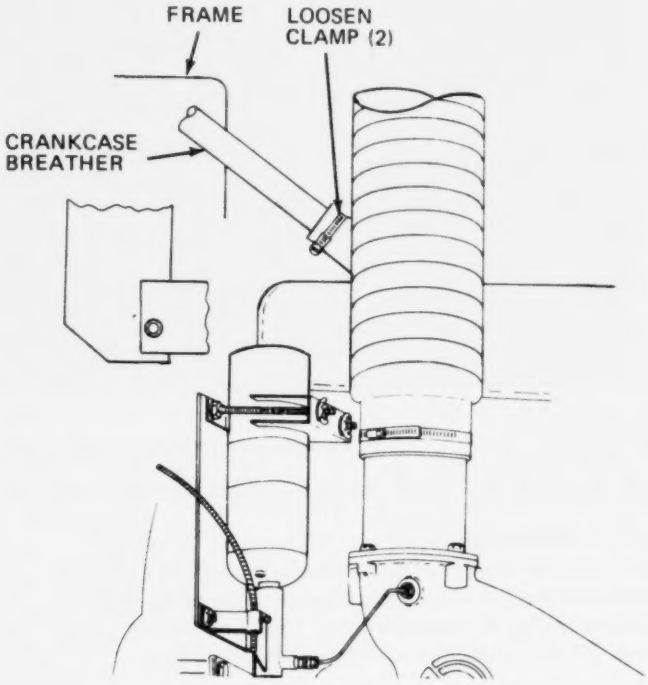


Figure 4-3. Crankcase breather, removal and installation.

4-15. Oil Level Dipstick

Remove left engine side panel. Refer to figure 4-4 for removal and installation of oil level dipstick.

4-16. Oil Filler Pipe and Cap

a. Removal. Remove left engine side panel for access to the oil filler pipe and cap. Refer to figure 4-4 and remove filler cap.

b. Cleaning and Inspection.

(1) Clean oil filler pipe and cap with dry cleaning solvent P-D-680 and dry thoroughly.

(2) Inspect cap seal for deterioration. Replace defective or damaged seal. Inspect filler pipe for cracks.

c. Installation. Refer to figure 4-4 and insta filler cap.

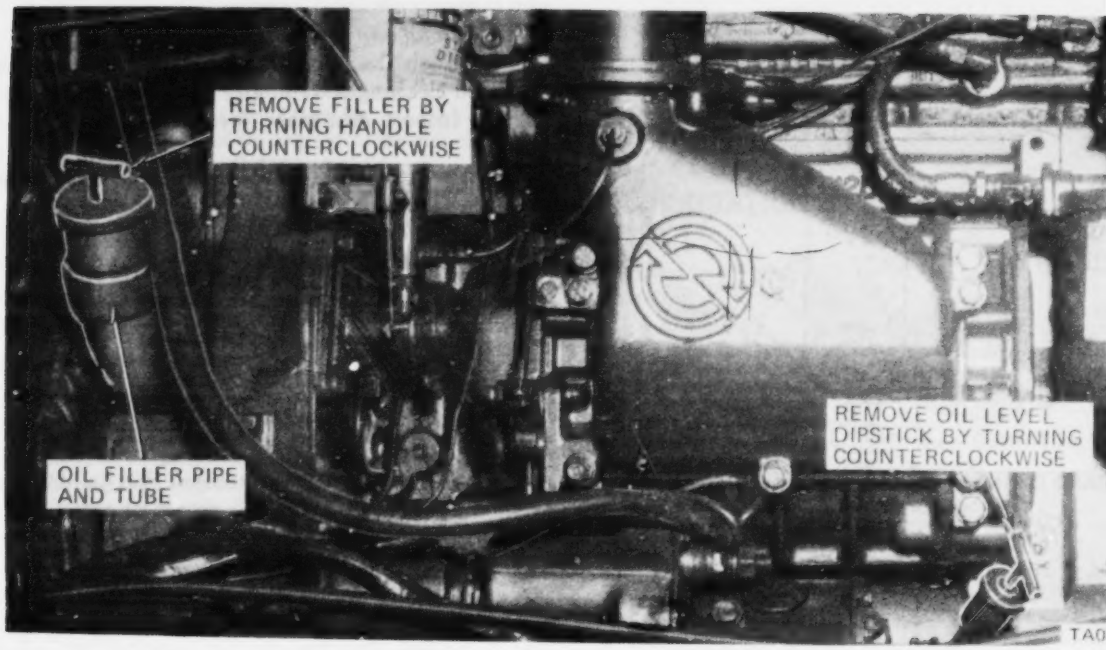

REMOVE FILLER BY TURNING HANDLE COUNTERCLOCKWISE
REMOVE OIL LEVEL DIPSTICK BY TURNING COUNTERCLOCKWISE
OIL FILLER PIPE AND TUBE
TA0

Figure 4-4. Oil level dipstick and oil filler pipe and cap, removal and installation.

Section VII. MAINTENANCE OF THE EXHAUST SYSTEM

4-17. General

This section contains information on the maintenance of those components of the exhaust system which is the responsibility of organizational maintenance personnel. These include the muffler and exhaust pipe.

4-18. Muffler and Exhaust Pipe

a. Removal. Refer to figure 4-5 and remo muffler and exhaust pipe.

b. Inspection. Inspect the muffler and exhau for cracks, dents and rust. Replace defective m

c. Installation. Refer to figure 4-5 and inst muffler and exhaust pipe.

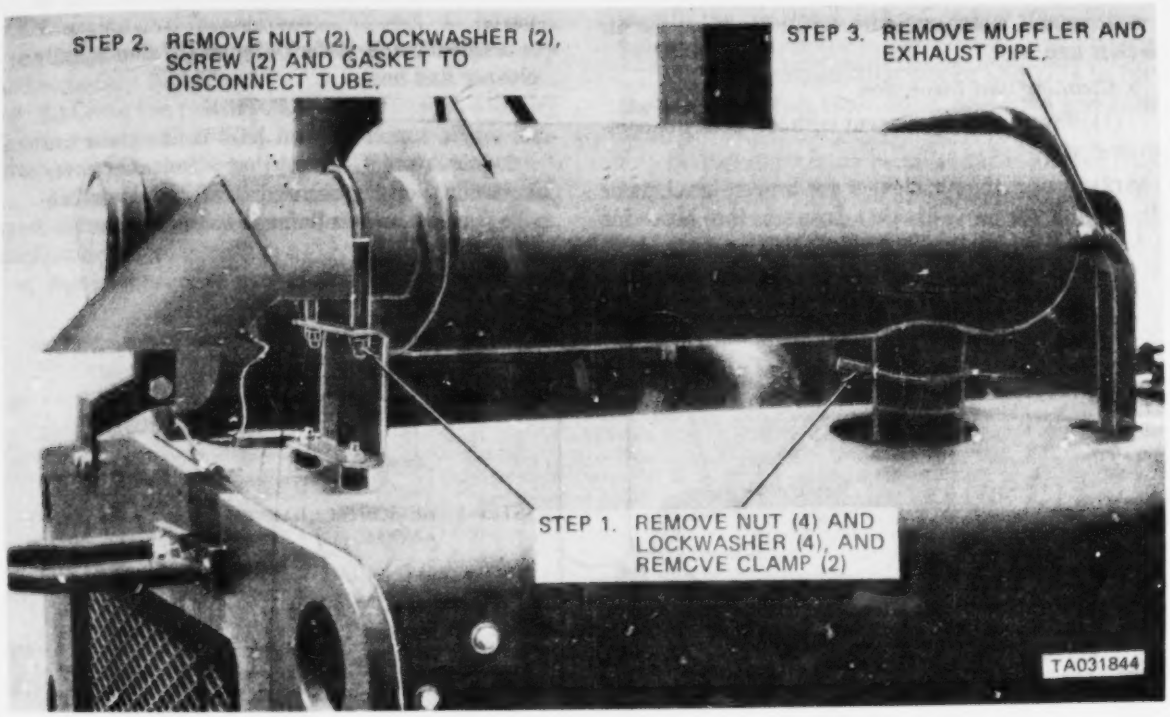

STEP 2. REMOVE NUT (2), LOCKWASHER (2), SCREW (2) AND GASKET TO DISCONNECT TUBE.
STEP 3. REMOVE MUFFLER AND EXHAUST PIPE.
STEP 1. REMOVE NUT (4) AND LOCKWASHER (4), AND REMOVE CLAMP (2)
TA031844

Figure 4-5. Muffler and exhaust pipe, removal and installation.

Section VIII. MAINTENANCE OF THE FUEL SYSTEM

4-19. General

This section contains information on the maintenance of those components of the fuel system which is the responsibility of organizational maintenance personnel. These include the fuel pump, air cleaner and hose and fuel filter.

4-20. Fuel Pump

WARNING

Dry cleaning solvent P-D-680, used to clean parts, is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 100°F-138°F.

a. Removal.

(1) Remove right engine side panel for access to fuel pump.

(2) Tag and disconnect two fuel lines as shown in figure 4-6.

(3) Remove three mounting screws and remove fuel pump.

b. Cleaning and Inspection.

(1) Clean the fuel pump with an approved cleaning solvent.

(2) Inspect the fuel pump for cracks, breaks or other damage. Replace a defective fuel pump.

c. Installation.

(1) Affix a new gasket to the pump body and locate pump drive coupling over square end of fuel pump drive shaft.

(2) Refer to figure 4-6 and install three mounting screws to the fuel pump.

(3) Reconnect two fuel lines.

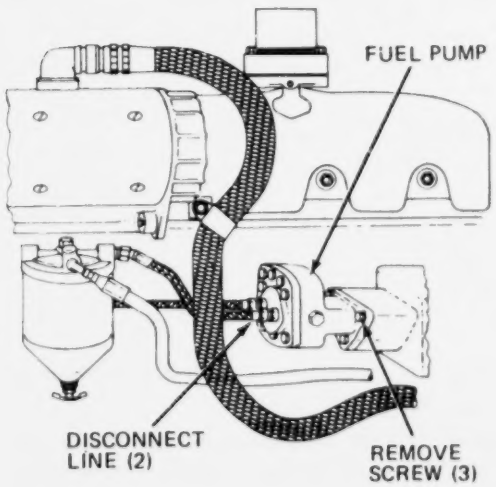


Figure 4-6. Fuel pump removal and installation.

4-21. Air Cleaner and Hose

a. Removal. Refer to figure 4-7 and remove the air cleaner and hose.

b. Cleaning and Inspection.

(1) Blow the air cleaner out with low pressure compressed air.

(2) Inspect the air cleaner for broken brackets or clamps, dents and cracks. Inspect the hose for deterioration or cuts. Replace any defective parts.

c. Installation. Refer to figure 4-7 and install cleaner and hose.

CAUTION

Be sure hose and hose connections are leak-proof. Insure that air cleaner cover is properly secured. Unfiltered air can cause serious damage to the engine.

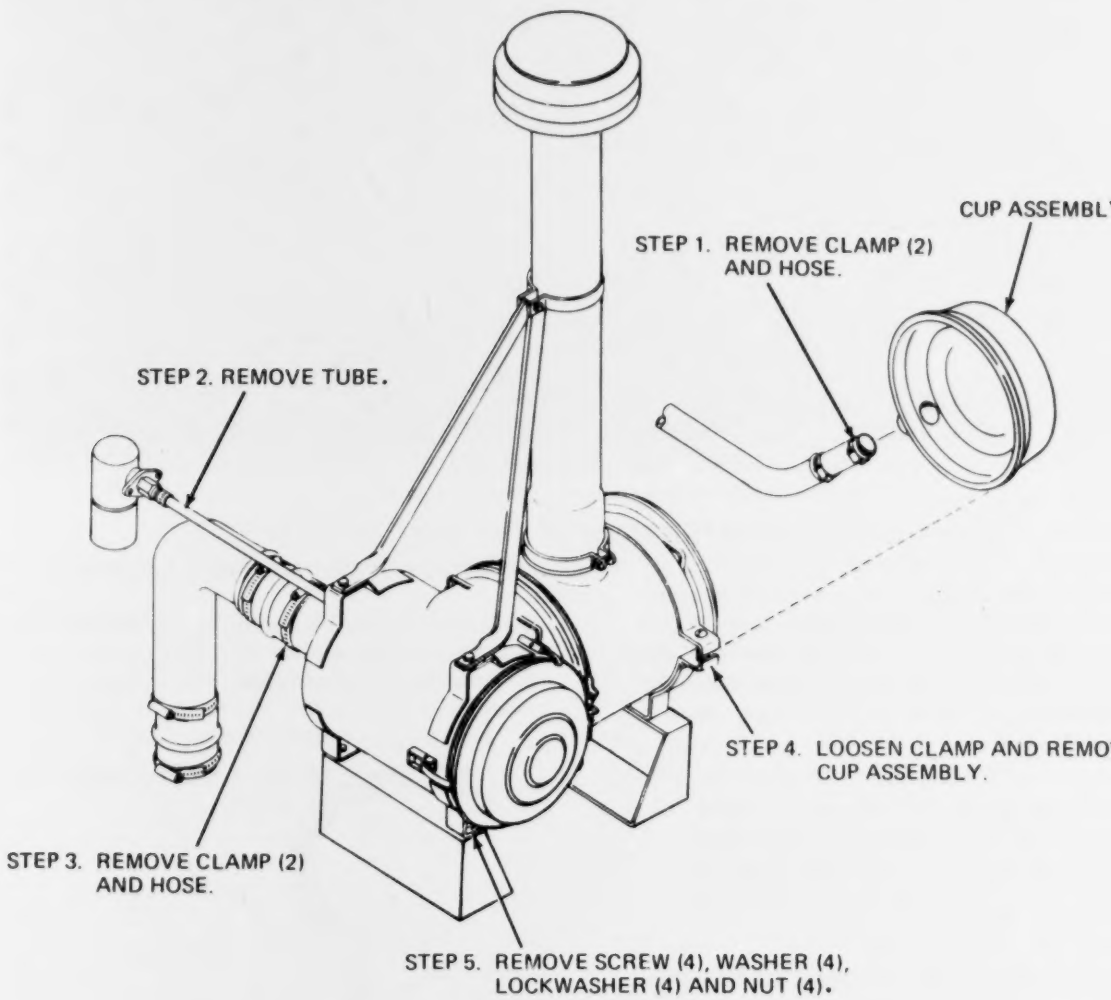

CUP ASSEMBL
STEP 1. REMOVE CLAMP (2) AND HOSE.
STEP 2. REMOVE TUBE.
STEP 4. LOOSEN CLAMP AND REMO CUP ASSEMBLY.
STEP 3. REMOVE CLAMP (2) AND HOSE.
STEP 5. REMOVE SCREW (4), WASHER (4), LOCKWASHER (4) AND NUT (4).
TA031

Figure 4-7. Air cleaner and hose, removal and installation.

4-22. Fuel Filters

a. General. Change the secondary filter every 250 hours of operation, and service the primary filter every 50 hours.

b. Removal. Remove the engine side panels for access to fuel filters. Refer to figure 4-8 and remove the filters as follows:

(1) Tag and disconnect two lines and elbow primary fuel filter. Remove two mounting scre nuts to remove primary fuel filter.

(2) Tag and disconnect electrical lead remove two pressure switches as shown.

(3) Tag and disconnect line and elbow and l adapter from secondary fuel filter. Remove two

ing screws and nuts to remove secondary fuel filter.

c. Cleaning and Inspection.

(1) Refer to figure 4-9 for servicing the primary and secondary fuel filters.

(2) Clean the primary fuel filter element with dry cleaning solvent (P-D-680). Dry with low pressure compressed air. Discard secondary fuel filter element.

(3) Inspect hoses for deterioration and cuts. Inspect filter bodies and heads for cracks and breaks. Replace defective parts.

d. Installation. Use new gaskets and be sure that mounting surfaces are clean. Refer to figure 4-8 and install the primary and secondary fuel filters as follows:

(1) Use two mounting screws and nuts to install the secondary fuel filter. Reconnect lines and fittings as shown.

(2) Install pressure switches and reconnect electrical leads.

(3) Use two mounting screws and nuts to install the primary fuel filter. Reconnect two lines and fittings as shown.

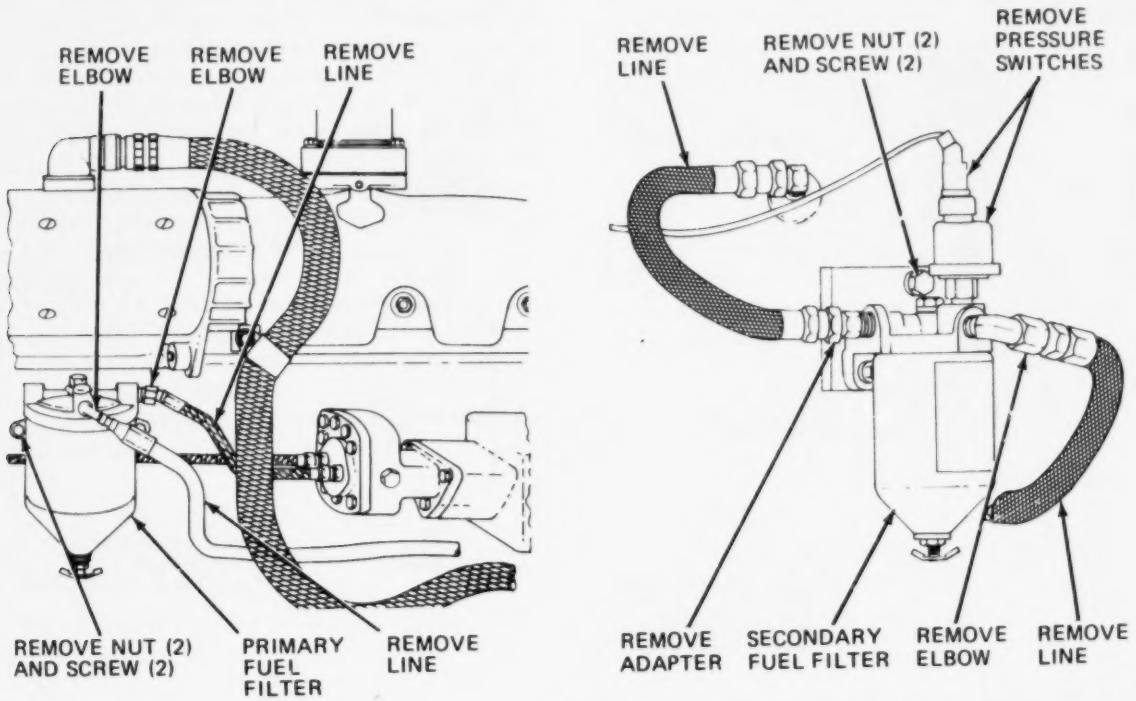


Figure 4-8. Fuel filters, removal and installation.

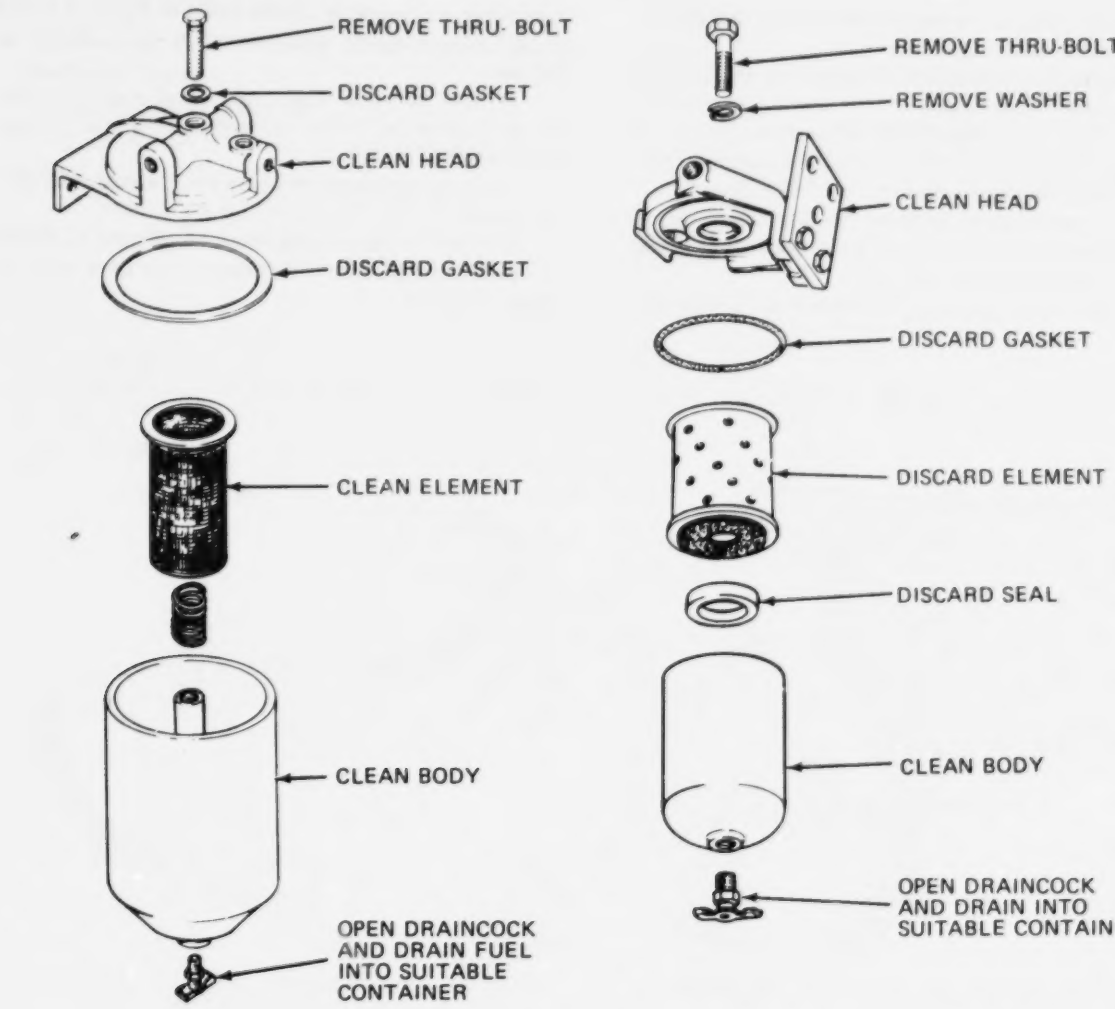


Figure 4-9. Fuel filter service.

Section IX. MAINTENANCE OF COOLING SYSTEM

4-23. General

The diesel engine is cooled by circulating the engine coolant through the radiator, transmission heat exchanger, cylinder block, and cylinder head. Coolant is drawn from the bottom of the radiator by the water pump and circulated through the heat exchanger, engine block and cylinder head. During warmup period, when coolant temperature is below normal, the coolant is restricted at the thermostat. A bypass tube connected between the termostat housing and the water pump provides circulation within the engine. As the coolant temperature rises above 160° to 17 thermostat valve opens to restrict the bypass and circulate coolant through the radiator. This contains information on the maintenance of th ponents of the cooling system which is the sibility of organizational maintenance person

4-24. Thermostat Housing and Therm

a. Removal.

(1) Drain the cooling system to below t mostat housing by opening the drain cock at th

of the radiator.

(2) Remove the engine hood (para. 4-70). Refer to figure 4-10 and remove the thermostat housing and thermostat.

b. Cleaning and Inspection.

(1) Clean the thermostat housing seat and gasket surface.

(2) Inspect the thermostat for an accumulation of rust and corrosion.

c. Testing. Check operation of thermostat. If thermostat remains closed, overheating of engine will result. If thermostat remains open, engine may not reach normal operating temperature, resulting in incomplete fuel combustion and carbon buildup. To check operation of the thermostat, suspend it and a thermometer in a container of water. Do not let the thermometer or thermostat touch the bottom or sides of the container. Heat the water and agitate to maintain an even temperature. As water is heated, the thermostat should begin to open at 160° to 170°F., and should be fully open at approximately 190° F.

d. Installation.

(1) Affix a new gasket to thermostat housing and seat thermostat in housing so that the spring (or bellows is down or toward the hot water side with the unit bolted to the cylinder head.

(2) Refer to figure 4-10 and install thermostat housing and hose.

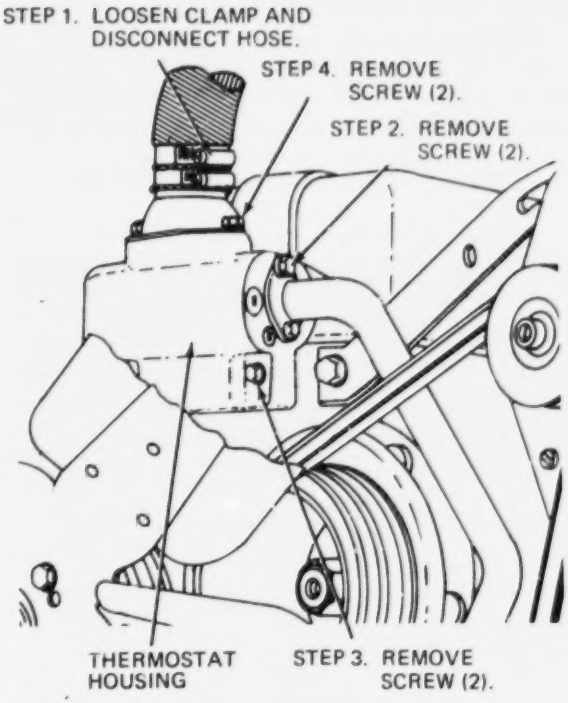

STEP 1. LOOSEN CLAMP AND DISCONNECT HOSE.
STEP 4. REMOVE SCREW (2).
STEP 2. REMOVE SCREW (2).
THERMOSTAT HOUSING
STEP 3. REMOVE SCREW (2).
NOTE: REMOVE THERMOSTAT FROM THERMOSTAT HOUSING AFTER HOUSING IS REMOVED.
TA031849

Figure 4-10. Thermostat housing and thermostat, removal and installation.

4-25. Water Pump and Pulley

a. Removal.

(1) Remove right engine side panel for access to water pump and pulley. Drain coolant system and refer to paragraph 4-28 to remove the generator and water pump drive belt.

(2) Refer to figure 4-11 and remove water pump and pulley.

b. Cleaning and Inspection.

(1) Clean the water pump housing with an approved cleaning solvent. Clean water pump gasket surface, making sure surface is free from old gasket material.

(2) Inspect water pump housing and pulley for cracks and damage. Make sure water pump turns freely. Replace a defective pump.

c. Installation. Affix a new gasket to the pump body. Refer to figure 4-11 and install the water pump and pulley. Fill cooling system. For repair of pump, report to direct support maintenance.

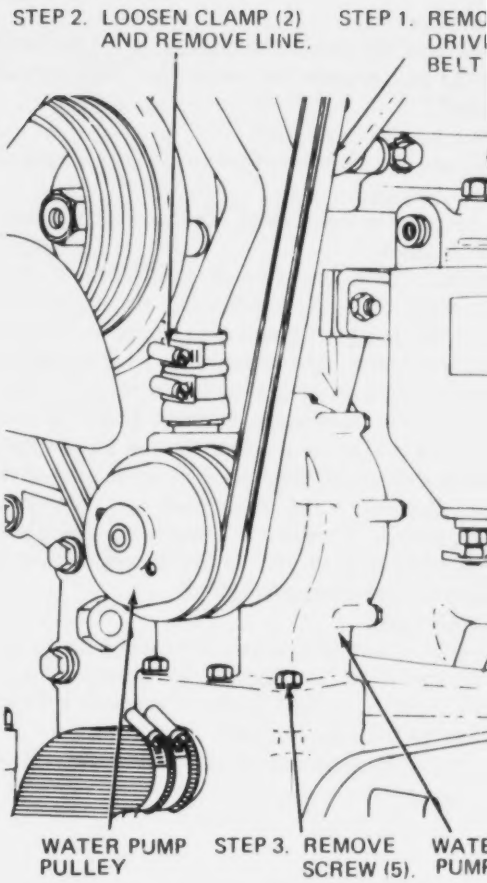

STEP 2. LOOSEN CLAMP (2) AND REMOVE LINE.
STEP 1. REMO DRIV BELT
WATER PUMP PULLEY
STEP 3. REMOVE SCREW (5).
WATE PUMP
NOTE: USE A SUITABLE PULLER TO REM WATER PUMP PULLEY.
TA03

Figure 4-11. Water pump and pulley, removal and ins

4-26. Coolant Hoses and Fittings

a. Removal. Remove engine hood and right side panel. Drain cooling system and refer to figure 4-12 to remove coolant hoses and fittings.

b. Cleaning and Inspection.

(1) Clean hose fittings and gasket surface.

(2) Inspect fittings and surfaces for cracks and damage. Inspect hoses for deterioration and cuts. Replace defective parts and hoses.

c. Installation. Refer to figure 4-12 and install coolant hoses and fittings. Refill cooling system.

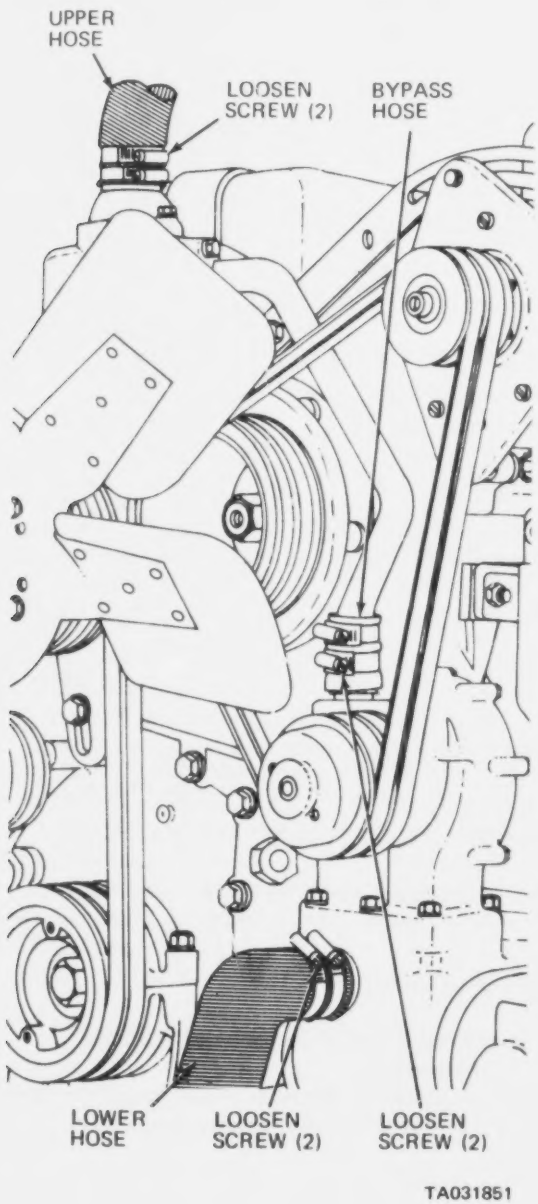


Figure 4-12. Coolant hoses and fittings, removal and installation.

4-27. Fan Guard

a. Removal. Remove engine hood and side panels for access to fan guard. Refer to figure 4-13 and remove fan guard.

b. Inspection. Inspect the fan guard for cracks and breaks. Replace a defective fan guard.

c. Installation. Refer to figure 4-13 and install fan guard.

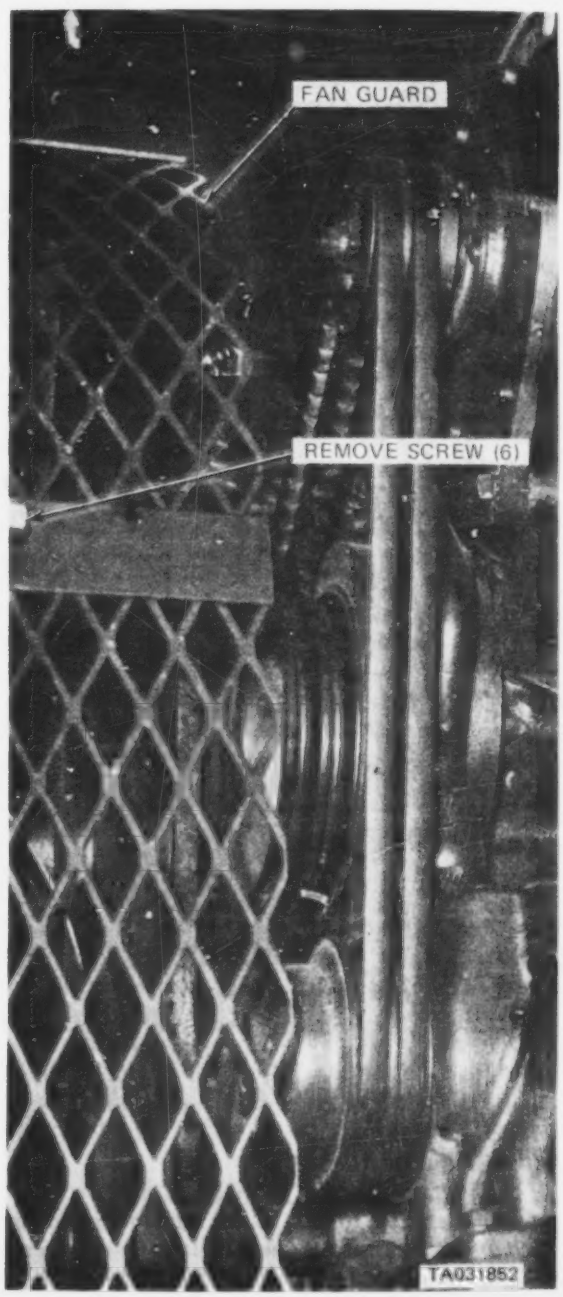


Figure 4-13. Fan guard, removal and installation.

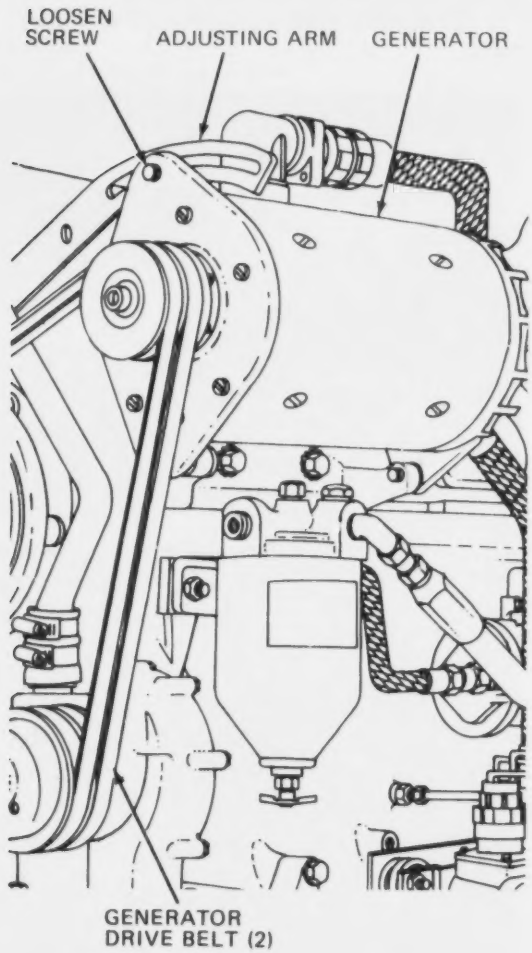
4-28. Drive Belts

a. Removal. Remove engine hood and side panels. Refer to figure 4-14 and remove generator and fan drive belts.

b. Inspection. Inspect the belts for cuts and deterioration. Replace defective belts.

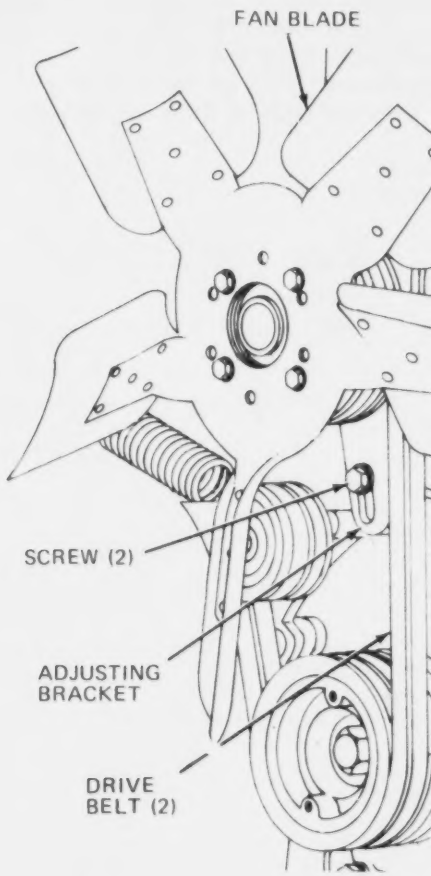
c. Installation. Refer to figure 4-14 and in generator and fan drive belts.

d. Adjustment. Refer to figure 3-3 and a drive belts.



NOTE: LOOSEN SCREW AND MOVE GENERATOR TOWARD ENGINE UNTIL BELTS CAN BE REMOVED.

A. GENERATOR DRIVE BELT.



NOTE: LOOSEN SCREW (2) AND S BELT (2) OVER FAN BLAD

B. FAN DRIVE BELT.

Figure 4-14. Drive belts, removal and installation.

4-29. Fan Blade

a. Removal.

(1) Remove the fan guard (para. 4-27).

(2) Refer to figure 4-15 and remove the fan blade.

b. Inspection. Inspect the fan blade for nicks, cracks and breaks. Replace a defective fan blade.

c. Installation.

(1) Refer to figure 4-15 and install the fa

(2) Install the fan guard (para. 4-27).

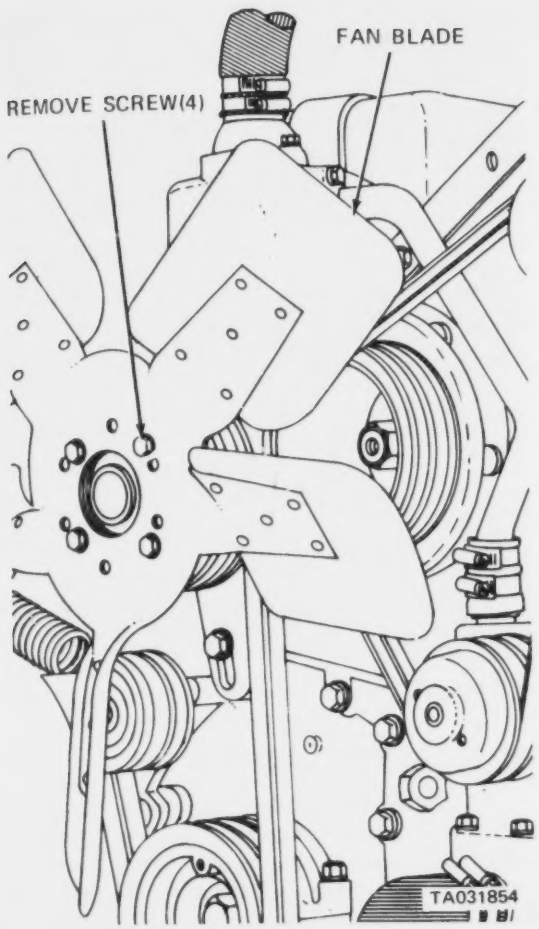


Figure 4-15. Fan blade, removal and installation.

4-30. Pulley and Hub

a. Removal.

(1) Remove the fan blade (para. 4-29).

(2) Refer to figure 4-16 and remove the pulley and hub.

b. Cleaning and Inspection.

(1) Clean the pulley and hub with an approved cleaning solvent.

(2) Inspect the pulley and hub for cracks and breaks. Replace a defective pulley and hub.

c. Installation.

(1) Refer to figure 4-16 and install the pulley and hub.

(2) Install the fan blade (para. 4-29).

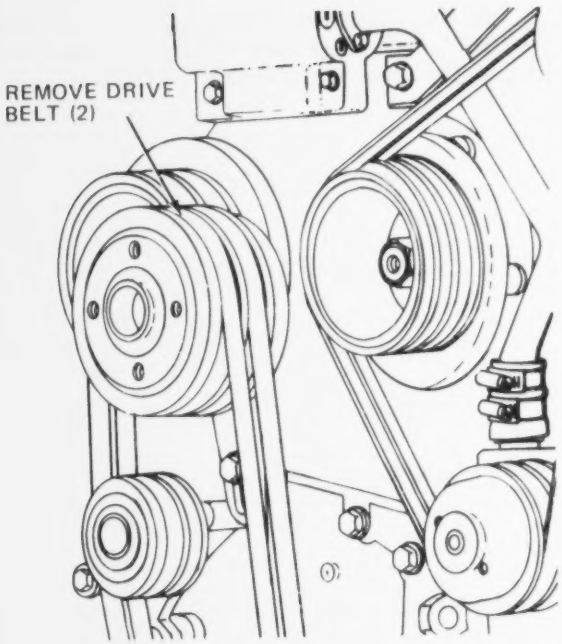


Figure 4-16. Pulley and hub, removal and installation.

4-31. Fan Belt Tension Control Spring and Bracket

a. Removal.

(1) Move the radiator fan control lever (fig. 2-1) to the ON position. In this position the spring is shortened, which will permit the spring loop to be pulled from the bracket with relative ease. Remove the fan guard (para. 4-27).

(2) Refer to figure 4-17 and remove the fan belt tension control, spring and bracket pulley.

b. Cleaning and Inspection.

(1) Clean all parts with dry cleaning solvent (P-D-680) and dry thoroughly.

(2) Inspect for cracks, rust and breaks. Replace defective parts.

c. Installation.

(1) Refer to figure 4-17 and install the fan belt tension control, spring and bracket pulley. Install the fan guard.

(2) Move the radiator fan control lever to the ON position to facilitate installation of the spring. Install spring. Move fan control lever to off position.

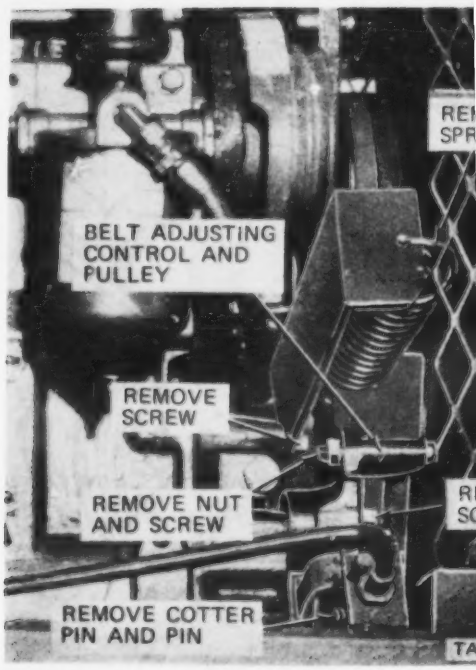


Figure 4-17. Fan belt tension control, spring and br pulley, removal and installation.

Section X. MAINTENANCE OF THE ELECTRICAL SYSTEM

4-32. General

This section contains information on the maintenance of the electrical system which is the responsibility of organizational maintenance personnel.

WARNING

Before disconnecting any electrical components, make sure battery cables are disconnected at batteries to prevent a serious burn or shock to personnel or damage to the equipment. Disconnect battery ground cable first. When reconnecting batteries, starter or any bare, unprotected wires, coat with silicone rubber adhesive.

4-33. Engine Generator

a. On-Equipment Testing of Generator and Voltage Regulator.

(1) Refer to figure 4-18 and install a suitable adapter in the generator receptacle.

(2) When a high-charging rate with fully charged batteries is indicated, operate the unit at half throttle and disconnect the field jumper. If the output remains high, the fault is in the generator. If the output drops to zero, the fault is in the regulator. Replace a defective generator and/or regulator.

(3) When a low or no-charging rate with or fully discharged batteries is indicated, ins loose connections or damaged wiring. If r found, stop the engine and disconnect the field Momentarily connect a jumper wire betw generator field terminal and the positive ter the batteries to polarize the generator. Recon field jumper and start the engine. If the charg does not increase as the engine speed is increa the engine and connect a jumper wire betwee mature and field terminals. If the charging r not increase as the engine speed is increa generator is faulty. Replace defective generato regulator.

b. Removal. Remove right engine side panel. figure 4-19 and remove engine generator.

c. Cleaning and Inspection.

(1) Clean generator housing and bracket approved cleaning solvent.

(2) Inspect the generator and bracket for breaks, and loose or worn bearings. Check wi cuts and deterioration.

d. Installation. Refer to figure 4-19 and ins engine generator.

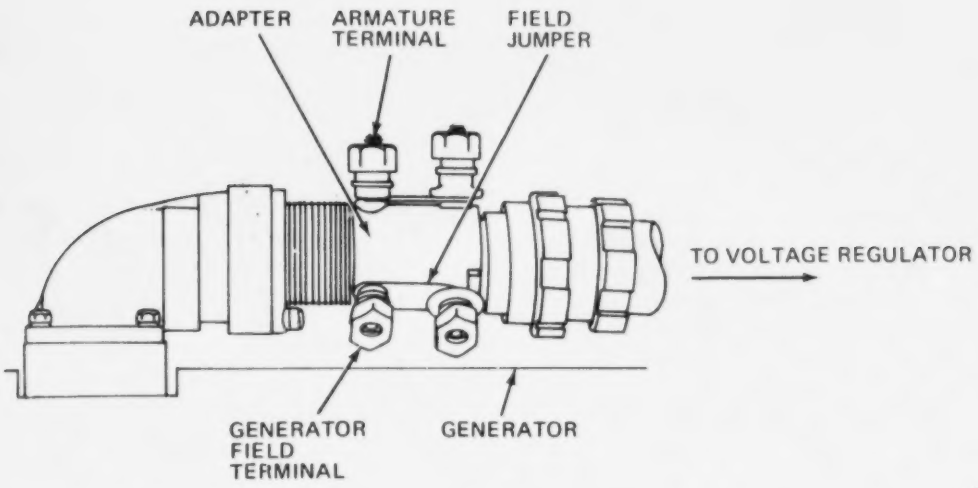


Figure 4-18. Engine generator and voltage regulator, on-equipment testing.

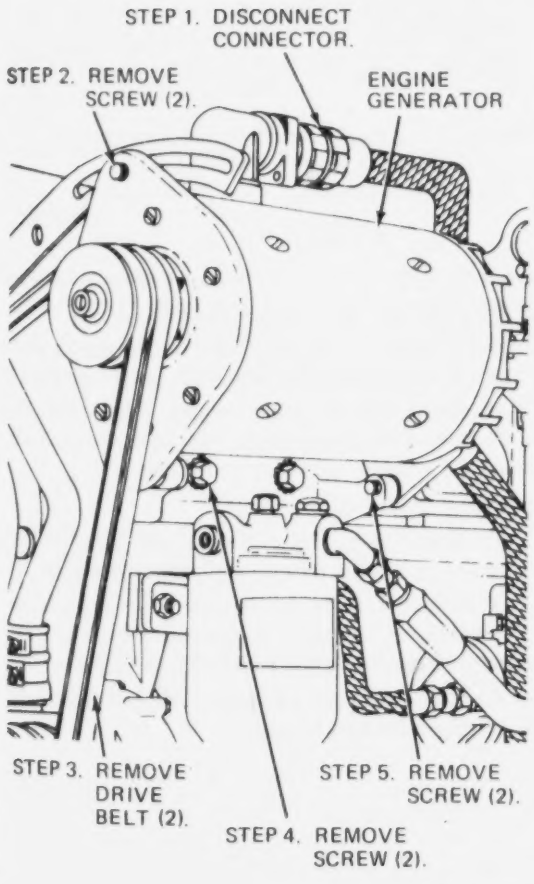

STEP 1. DISCONNECT CONNECTOR.
STEP 2. REMOVE SCREW (2).
ENGINE GENERATOR
STEP 3. REMOVE DRIVE BELT (2).
STEP 4. REMOVE SCREW (2).
STEP 5. REMOVE SCREW (2).
TA031858

Figure 4-19. Engine generator, removal and installation.

4-34. Battery Holddown Cover, Batteries, and Cables.

WARNING

Always disconnect battery ground cable first.

a. Removal.

(1) Disconnect battery ground cable. Then, refer to figure 4-20 and remove the positive, negative, and jumper cables as shown.

(2) Remove four wing nuts and lift out the battery holddown cover.

(3) Lift out two batteries.

b. Cleaning and Inspection.

(1) Clean the battery holddown cover, batteries and cables.

(2) Inspect the cover for cracks and breaks. Check batteries for corrosion and electrolyte level. Inspect cables for security and corrosion. Replace defective parts. Refer to TM 9-6140-200-15 for maintenance of batteries.

c. Painting. Paint the battery areas as necessary with an acid resistant paint to prevent corrosion.

d. Installation.

(1) Install two batteries in case.

(2) Use four wing nuts to reinstall battery holddown cover.

(3) Refer to figure 4-20 and reconnect the positive, negative, and jumper cables as shown. Reconnect battery ground cable.

CAUTION

This is a negative ground system. To reverse polarity will damage the voltage regulator. Be sure all battery connections are clean and secure.

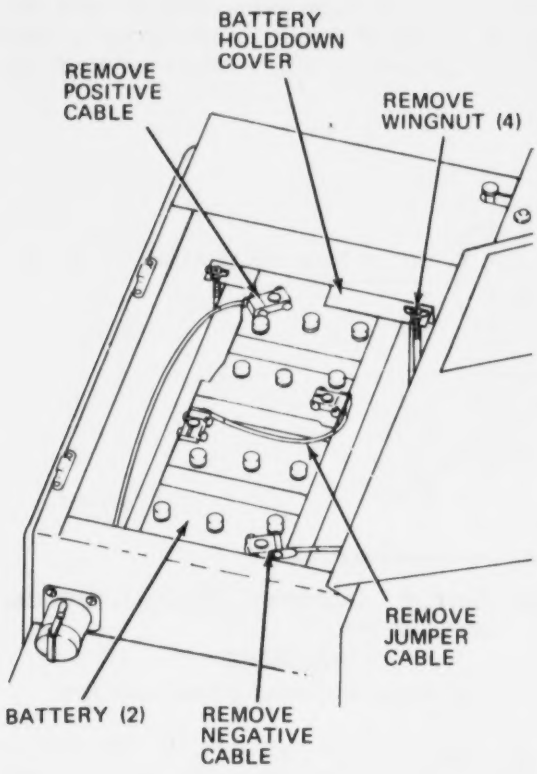


Figure 4-20. Battery holddown cover, batteries and cables, removal and installation.

4-35. Receptacle Slave Connector

a. Removal. Refer to figure 4-21 and remove the receptacle slave connector.

b. Inspection. Inspect for corrosion, broken or frayed wires. Replace defective parts.

c. Installation. Refer to figure 4-21 and install the receptacle slave connector.

CAUTION

When cables are replaced, insure that the positive (+) cable is equipped with the large battery post connector and that the negative (-) cable is grounded to the engine. When installing the receptacle, place the positive (+) connector up in relation to its mounted position.

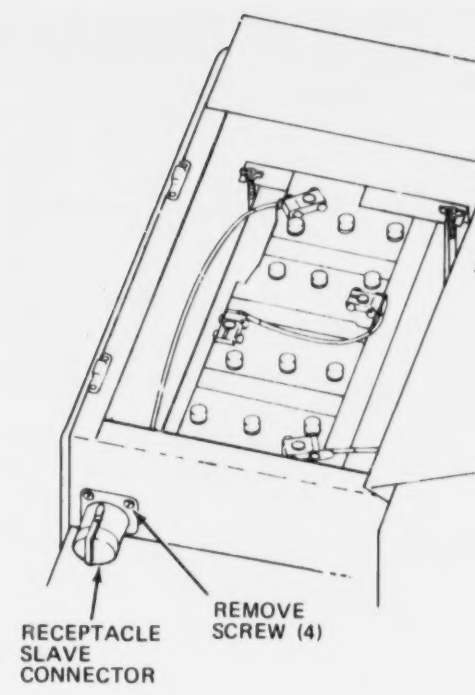


Figure 4-21. Receptacle slave connector, removal and inst

4-36. Voltage Regulator and Bracket

a. On-Equipment Testing. Refer to paragrapl and test voltage regulator along with engine ger

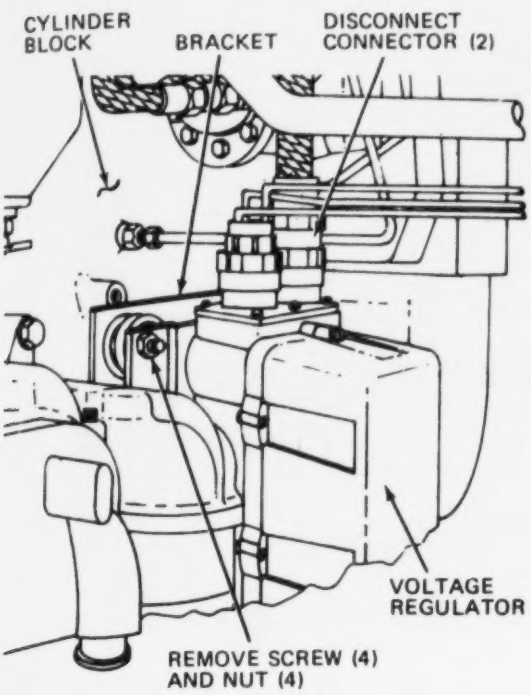
b. Removal. Remove right engine side pan and disconnect electrical leads; refer to figure 4- remove the voltage regulator and bracket.

c. Cleaning and Inspection.

(1) Clean the voltage regulator and brack an approved cleaning solvent and dry thorough

(2) Inspect bracket for cracks or breaks a spect regulator for loose hardware, corrosio damaged connectors. Replace all defective part

d. Installation. Refer to figure 4-22 and inst voltage regulator and bracket.



NOTE: REMOVE NUT (4) AND SCREW (8) THAT SECURE VOLTAGE REGULATOR AND BRACKET TO CYLINDER BLOCK.

TA031861

Figure 4-22. Voltage regulator and bracket, removal and installation.

4-37. Starter and Solenoid

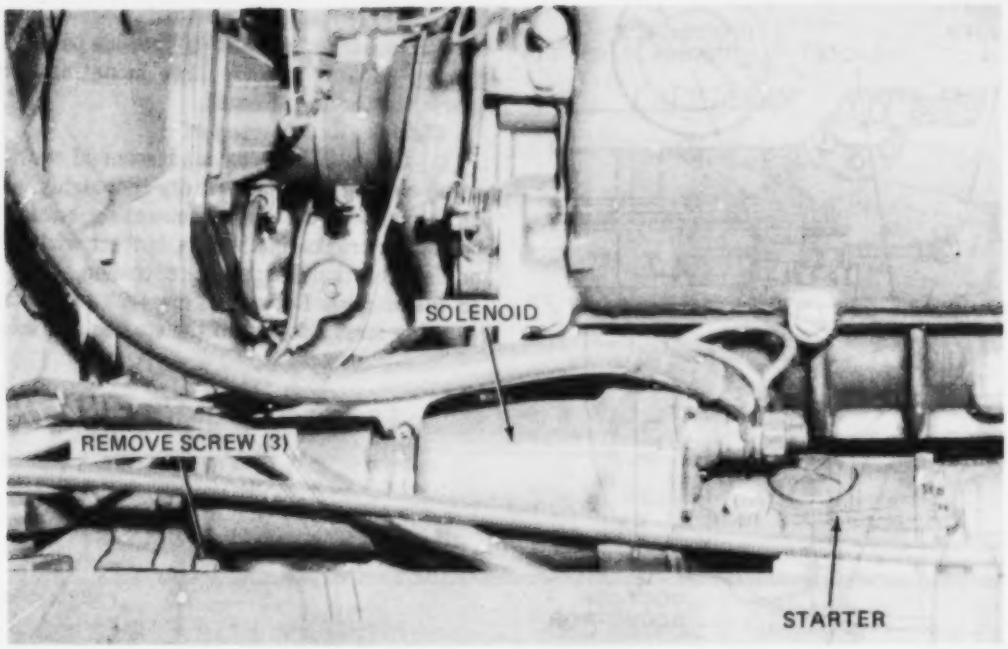
a. Removal. Remove left engine side panel. Refer to figure 4-23 and remove three mounting screws to remove starter and solenoid.

b. Cleaning and Inspection.

(1) Clean the starter and solenoid with an approved cleaning solvent and dry thoroughly.

(2) Inspect the starter mounting hardware and housing for cracks and breaks. Inspect wiring for cuts and deterioration. Inspect for corrosion.

c. Installation. Refer to figure 4-23 and install three mounting screws to install the starter and solenoid.



NOTE: TAG AND DISCONNECT ELECTRICAL LEADS

TA031

Figure 4-23. Starter and solenoid, removal and installation.

4-38. Neutral Start Switch

a. Testing. To test the neutral start switch, connect a test light between the switch terminals. Place the forward-neutral-reverse control lever in the neutral position. The test light should light. If not, place the valve plunger in the neutral position by hand. If the test light lights, then the problem is in the valve control linkage. If the test light does not light, then the neutral start switch is defective.

b. Removal. The neutral start switch is locat the transmission control valve. Refer to figure 4-2 remove the neutral start switch.

c. Cleaning and Inspection.

(1) Clean the neutral start switch with a proved cleaning solvent.

(2) Inspect the switch for corrosion. Check v for cuts and deterioration. Replace a defective s

d. Installation. Refer to figure 4-24 and insta neutral start switch.

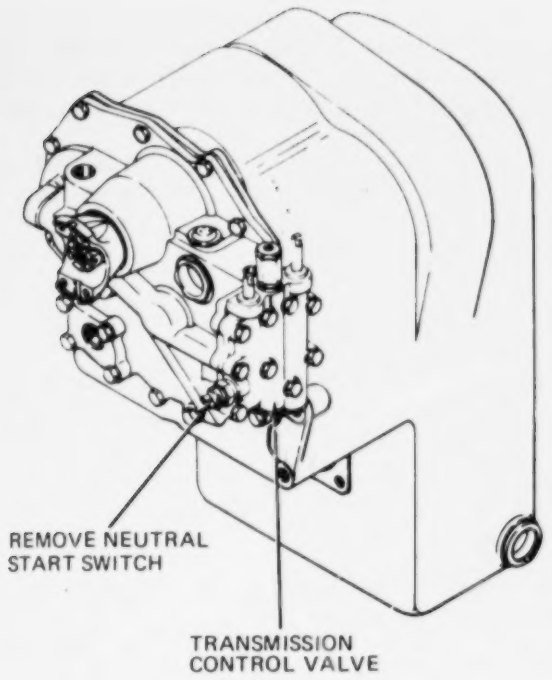


Figure 4-24. Neutral start switch.

4-39. Brake Pressure Switch

a. General. The brake pressure switch is located on the rearward structural member of the battery carrier, adjacent to the hydraulic oil reservoir. For access, remove the left engine side panel. From this access point, the device is located high and to the left. An alternate access point is through the battery carrier, adjacent to the hydraulic oil reservoir. The signal is activated when the accumulator hydraulic pressure drops below 300 psi. Buzzer warning indicates that it is unsafe to operate the vehicle.

b. Testing.

(1) Disconnect one of the two wire leads that go to the brake pressure switch.

(2) Start and operate the engine for at least one minute to build up the hydraulic oil pressure in the accumulator.

(3) With the wire lead disconnected, use a multimeter to test for continuity across the two wire lead terminals. There should be no continuity indicated.

(4) Stop the engine and operate brake pedal several times until all hydraulic pressure in the accumulator is exhausted.

(5) Again, test across the terminals. This time there should be continuity indicated.

(6) Replace a defective brake pressure switch.

c. Removal.

WARNING

Always bleed off the pressure before opening any part of the hydraulic brake system by operating the brake pedal several times with the engine not running. Failure to observe this warning may result in serious injury to personnel.

(1) Bleed off hydraulic pressure by operating brake pedal until all pressure has been depleted.

(2) Refer to figure 4-25 and remove the brake pressure switch.

d. Cleaning and Inspection.

(1) Clean the brake pressure switch with a cloth dampened in dry cleaning solvent P-D-680 or equal. Do not immerse the switch in solvent or allow it to be saturated by solvent.

(2) Inspect the switch for corrosion, cracks, damaged threads or other damage. Replace a defective switch.

e. Installation. Refer to figure 4-25 and install the brake pressure switch.

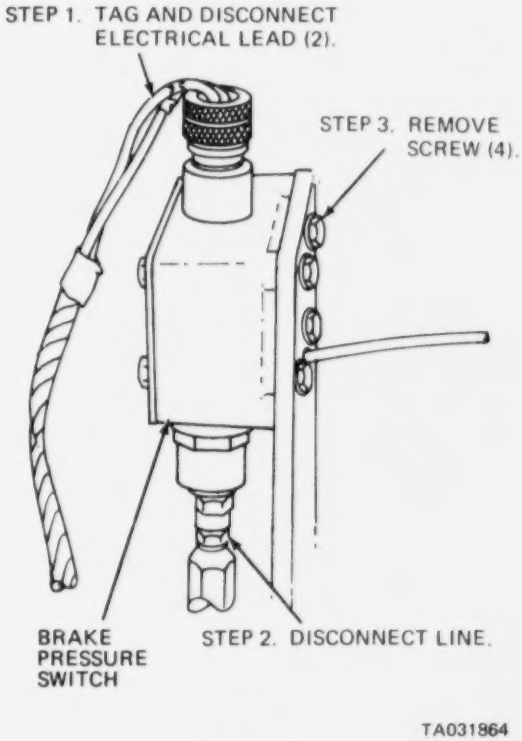


Figure 4-25. Brake pressure switch, removal and installation.

4-40. Stoplights, Blackout Lights, Headlights, Horn and Taillights

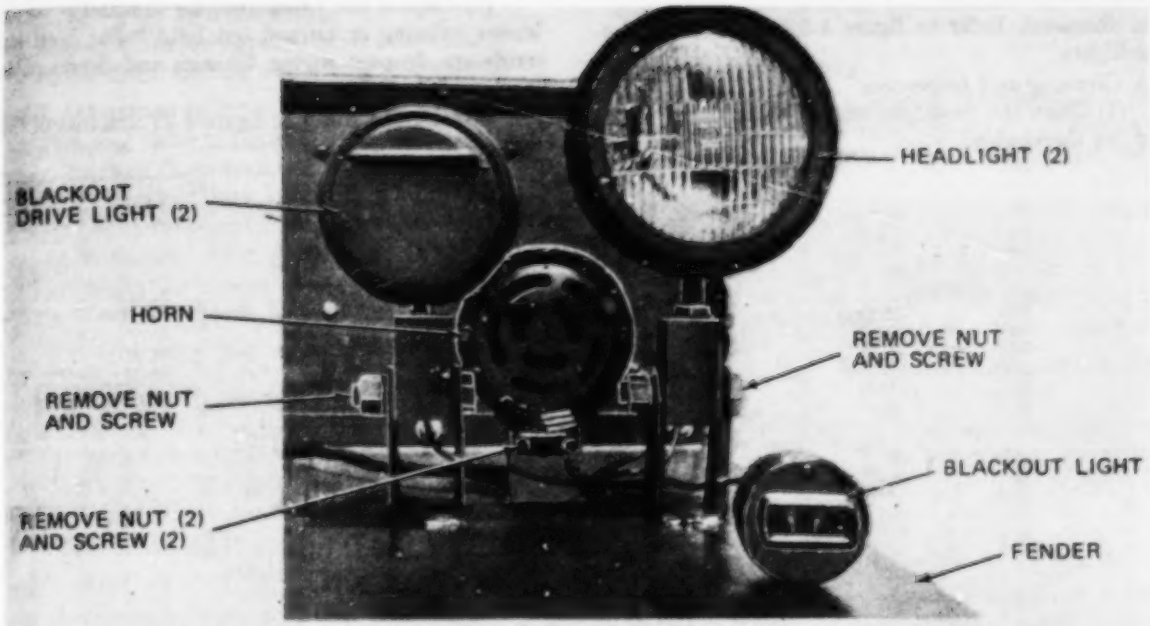
a. Removal. Refer to figure 4-26 and remove mounting hardware as shown to remove stoplights, blackout lights, headlights, horn and taillights.

b. Cleaning and Inspection.

(1) Clean the stoplights, blackout lights, headlights and taillights lenses with a damp cloth and dry thoroughly. Clean horn with low pressure compressed air.

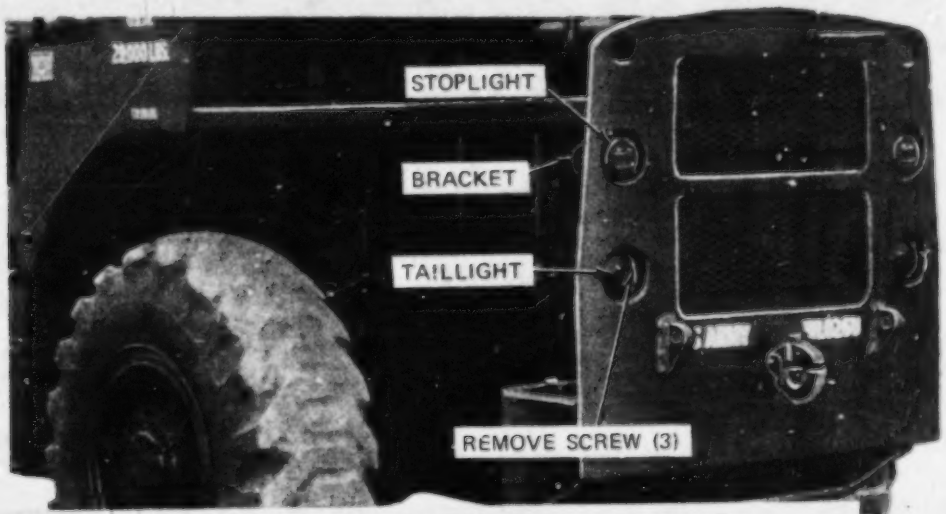
(2) Inspect all lights for cracked or broken
loose hardware and missing or burned out light
Inspect all airing for cuts and deterioration. R
all defective parts.

c. Installation. Refer to figure 4-26 and
stoplights, blackout lights, headlights, hor
taillights.



NOTE: TAG AND DISCONNECT ELECTRICAL LEADS AS NECESSARY.
NOTE: REMOVE OTHER LIGHT IN A SIMILAR MANNER.

A. HEADLIGHT, HORN, AND BLACKOUT LIGHTS.



NOTE: REMOVE SCREW (2) THAT SECURE STOPLIGHT TO BRACKET.
NOTE: TAG AND DISCONNECT ELECTRICAL LEADS AS NECESSARY.
NOTE: REMOVE OTHER STOPLIGHT AND TAILLIGHT IN A SIMILAR MANNER.

B. STOPLIGHT AND TAILLIGHT

TA031865

Figure 4-26. Stoplights, blackout lights, headlights, horn and taillights, removal and installation.

4-41. Floodlights

a. Removal. Refer to figure 4-27 and remove the floodlights.

b. Cleaning and Inspection.

(1) Clean the floodlight lenses with a damp cloth and dry thoroughly.

(2) Inspect the floodlights for cracked or l lenses, missing or burned out light bulbs, and hardware. Inspect wiring for cuts and deterio Replace defective parts.

c. Installation. Refer to figure 4-27 and instal lights.

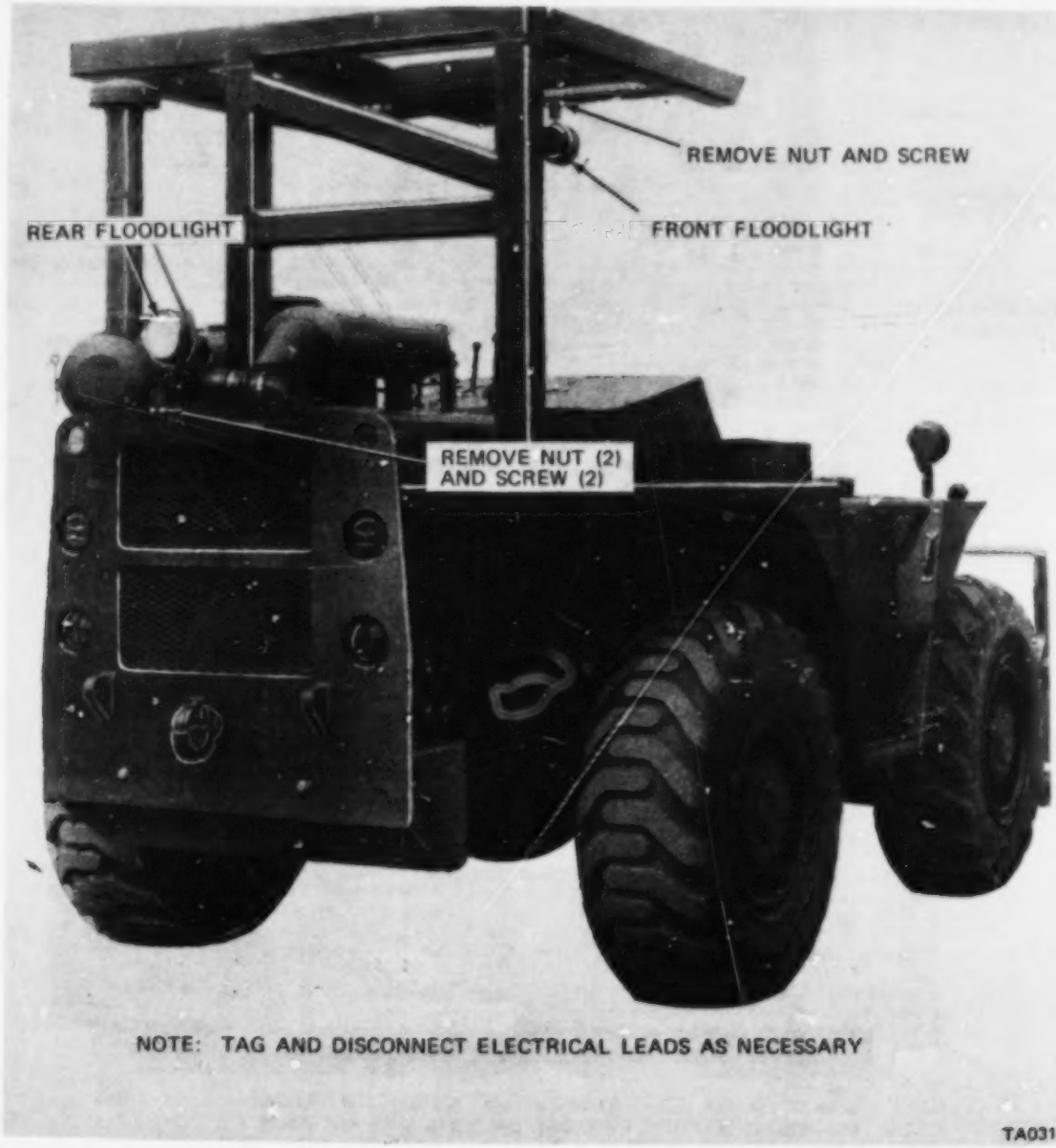


Figure 4-27. Floodlights, removal and installation.

Section XI. MAINTENANCE OF CONTROLS AND INSTRUMENTS

4-42. General

This section contains information on the maintenance of all the controls and instruments on the forklift truck which is the responsibility of organizational m nance personnel.

WARNING

Disconnect battery ground cable from battery before disconnecting any wiring under dash.

4-43. Hourmeter

a. Removal. Refer to figure 4-28 for location of hourmeter. Tag and disconnect electrical lead. Remove six nuts, six screws and three lockwashers attaching hourmeter to instrument panel and remove hourmeter.

b. Inspection and Testing.

(1) Inspect the hourmeter for broken glass and the electrical wiring for cuts, breaks and deterioration.

(2) Connect hourmeter to a power source and check for proper operation by checking indicator above odometer wheels. Indicator should revolve once per minute.

(3) Replace a defective hourmeter.

c. Installation. Reinstall hourmeter in instrument panel using six screws, three lockwashers and six nuts. Reconnect electrical lead.

4-44. Battery and Generator Indicator

a. Removal. Refer to figure 4-28 for location of battery and generator indicator. Tag and disconnect electrical connection. Remove three nuts and lockwashers to remove indicator from instrument panel.

b. Testing. Test the battery and generator indicator by connecting it to a power source along with another voltmeter of known accuracy. Compare the readings on both meters to determine the accuracy of the indicator. The indicator readings should correspond as follows: red (lh), 18-22V; yellow, 22-26V; green, 26-30V; and red (rh), 30-34V.

c. Inspection. Inspect the battery and generator indicator for broken cover glass and loose electrical connections. Replace a defective indicator.

d. Installation. Reinstall three mounting nuts and lockwashers to install battery and generator indicator in instrument panel.

4-45. Toggle Switches

a. General. The two toggle switches control the front and rear floodlights. Before removing switches, check operation in ON and OFF positions by observing operation of the floodlights. Before attributing a malfunction to a defective switch, make sure that lamps are not burned out and that electrical connections are correct.

b. Removal. Refer to figure 4-28 for location of the front and rear floodlight toggle switches. Tag and disconnect electrical connections. Remove two locknuts to remove switch from instrument panel.

c. Cleaning and Inspection.

(1) Clean toggle switches with an approved cleaning solvent and dry thoroughly, or use low pressure compressed air and blow air into switch to clean.

(2) Inspect switches for loose connections or broken hardware. Replace a defective switch.

d. Installation. Mount toggle switch on instrument panel using two locknuts. Reconnect electrical connections.

4-46. Panel Lights

a. Removal. Refer to figure 4-28 for location of panel lights. Disconnect electrical connector and remove two mounting screws to remove panel lights from instrument panel.

b. Inspection. Inspect the panel lights for loose connections, defective wiring, and missing or burned out light bulbs. Replace defective lights.

c. Installation. Use two screws to mount panel light on instrument panel. Connect electrical connector.

4-47. Starter and Horn Push Button Switches

a. Testing. Test for a defective switch by disconnecting leads from switch to horn or starter, and connecting a test light between the switch terminals. Push the button. If the test light does not light, the switch is defective.

b. Removal.

(1) Refer to figure 4-28 for location of starter and horn push button switches.

(2) Tag and disconnect electrical connections.

(3) Unscrew boot covering push button and remove switch.

c. Inspection. Inspect switches for corrosion, loose connections and defective wiring. Replace a defective switch.

d. Installation.

(1) Screw boot and push button switch into instrument panel. Refer to figure 4-28 for proper location.

(2) Reconnect electrical connections.

4-48. Light Switch

a. General. The light switch controls the panel lights, headlights, taillights, marker lights, and blackout head lights and taillights. Operate switch and observe lights for proper operation. Check for burned out light bulbs and correct wiring before attributing failure to a defective switch.

b. Removal. Refer to figure 4-28 for location of light switch. Tag and disconnect electrical connections. Remove four screws mounting light switch to instrument panel and remove light switch.

c. Inspection. Inspect the light switch for cracks, breaks, loose connections, and defective or missing hardware. Replace a defective switch.

d. Installation. Use four screws to mount light switch to instrument panel. Reconnect electrical connections.

4-49. Hydraulic Control Levers

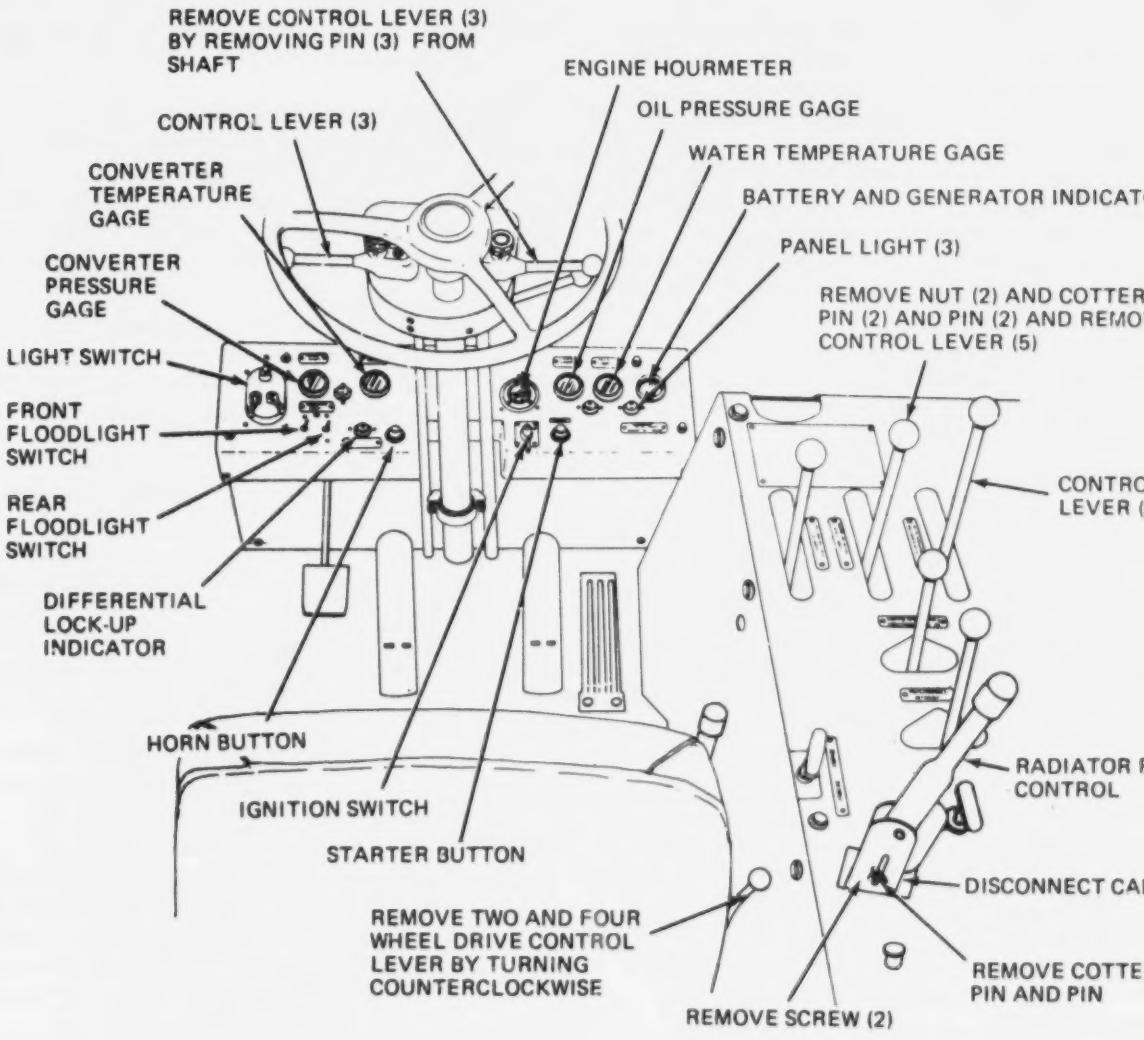
a. Removal. Refer to figure 4-28 and remove the hydraulic control levers.

b. Cleaning and Inspection.

(1) Clean the control levers with an approved cleaning solvent.

(2) Inspect the hydraulic control levers for cracks, breaks, and loose hardware. Replace a defective control lever.

c. Installation. Refer to figure 4-28 and instal hydraulic control levers.


REMOVE CONTROL LEVER (3) BY REMOVING PIN (3) FROM SHAFT
CONTROL LEVER (3)
CONVERTER TEMPERATURE GAGE
CONVERTER PRESSURE GAGE
LIGHT SWITCH
FRONT FLOODLIGHT SWITCH
REAR FLOODLIGHT SWITCH
DIFFERENTIAL LOCK-UP INDICATOR
HORN BUTTON
IGNITION SWITCH
STARTER BUTTON
ENGINE HOURMETER
OIL PRESSURE GAGE
WATER TEMPERATURE GAGE
BATTERY AND GENERATOR INDICAT
PANEL LIGHT (3)
REMOVE NUT (2) AND COTTER PIN (2) AND PIN (2) AND REMO CONTROL LEVER (5)
CONTRO LEVER (
RADIATOR CONTROL
DISCONNECT CA
REMOVE COTTE PIN AND PIN
REMOVE TWO AND FOUR WHEEL DRIVE CONTROL LEVER BY TURNING COUNTERCLOCKWISE
REMOVE SCREW (2)

NOTE: TAG AND DISCONNECT ELECTRICAL LEADS AND REMOVE MOUNTING HARDWARE AS NECESSARY.

TA03188

Figure 4-28. Controls and instruments, removal and installation.

4-50. Differential Lockout Control

a. General. The differential lockout control is located on the firewall of the driver's compartment. When the lockout pedal is pressed, brake fluid VV-B680B is forced to the lockout mechanism mounted on each differential. This action insures that each pair of driving wheels turn together.

b. Removal. Refer to figure 4-29 for location of differential lockout control and remove it as follo

(1) Remove spring at top of lockout pedal and connect line at bottom of lockout control valve.

(2) Remove four screws and lockwashers attac pedal assembly to the cockpit floor. Remove peda sembly.

c. Inspection and Service.

(1) Inspect the rubber boot and hoses for cuts

deterioration. Check for loose connections. Tighten loose connections and replace all defective parts.

(2) To service, lift the rubber boot on the valve assembly and fill to within ¾ inch from the top with brake fluid VV-B-680B. Depress pedal several times and recheck fluid level. A bleeder valve is provided at the lockout mechanism mounted on the differential. Reinstall rubber boot on valve assembly.

d. Installation. Refer to figure 4-29.

(1) Use four screws and lockwashers to attach pedal assembly to cockpit floor.

(2) Reconnect line to bottom of differential lock control cylinder.

(3) Attach spring to pedal and to bracket on cockpit fire wall.

4-51. Foot Controls

a. Removal. Refer to figure 4-29 and remove the foot controls as follows:

(1) Brake Pedal and Inching Pedal. Remove cotter pin and pin attaching each pedal to its linkage. Remove pedal.

(2) Throttle Pedal.

(*a*) Remove cotter pin and pin attaching pedal to throttle linkage.

(*b*) Remove two nuts, lockwashers and screws attaching throttle pedal to mounting plate and cockpit floor. Remove pedal.

b. Inspection. Inspect the foot controls for broken or missing hardware, cracks and damaged parts. Replace all defective parts.

c. Installation. Refer to figure 4-29 and install foot controls as follows:

(1) Brake Pedal and Inching Pedal. Set pedals in place and use cotter pin and pin to reconnect them to the correct control linkage.

(2) Throttle Pedal.

(*a*) Use two screws, nuts, and lockwashers to attach pedal to mounting plate and cockpit floor.

(*b*) Use cotter pin and pin to connect throttle pedal to the control linkage.

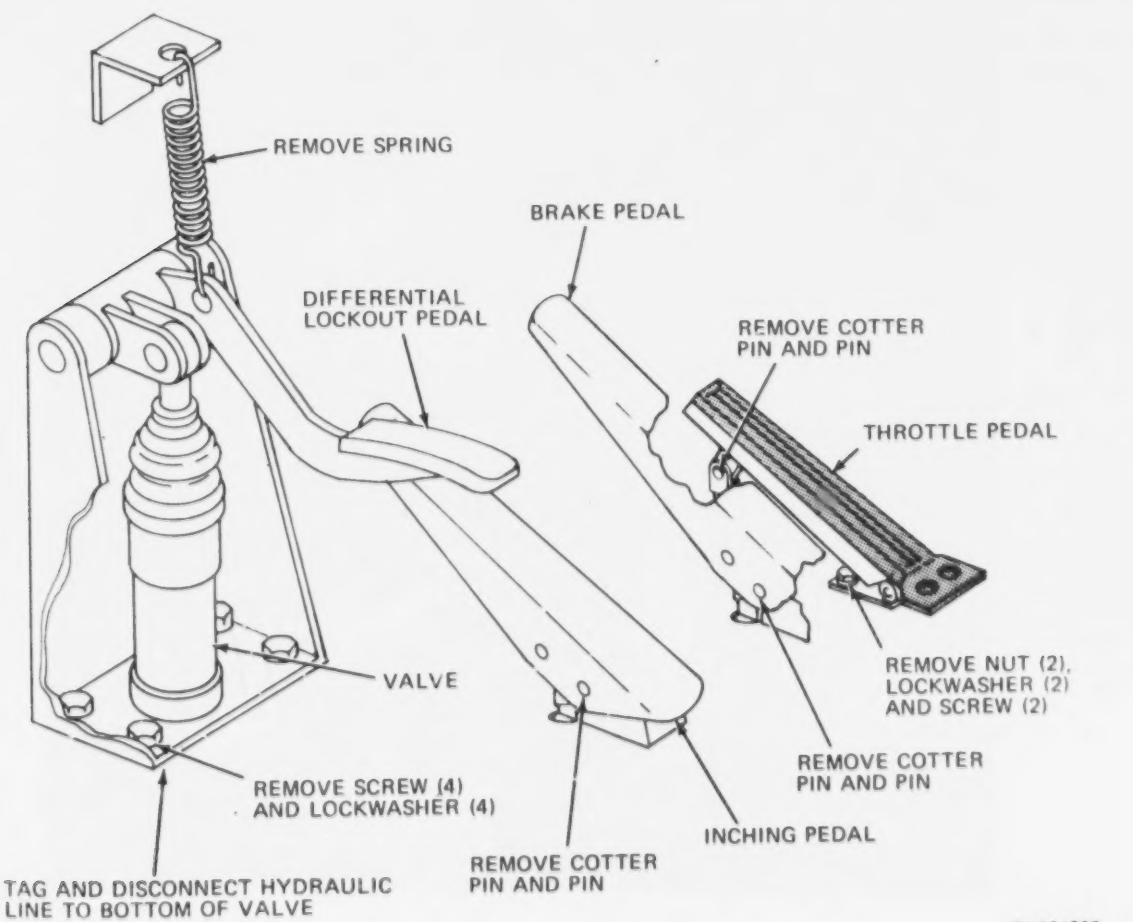


Figure 4-29. Foot controls, removal and installation.

Section XII. MAINTENANCE OF THE TRANSMISSION

4-52. General

This section contains information on the maintenance of the transmission to the extent required of organizational maintenance personnel.

4-53. Transmission External Filter

a. Removal. Remove the forward panel under the right rear fender. Refer to figure 4-30 and remove the transmission external fitter as follows:

(1) Tag and disconnect two hydraulic lines.

(2) Remove four mounting screws and lockwashers to remove filter from forklift truck.

NOTE

Change filter element at every transmission oil change. The filter element is a throw-away type paper element.

b. Cleaning and Inspection.

(1) Clean the filter head with an approved cleaning solvent and dry thoroughly. Make sure old g material is removed, install new filter elemen gasket.

(2) Inspect the filter for cracks, breaks and connections. Check the oil for contamination.

c. Installation. Refer to figure 4-30 and insta transmission external filter as follows:

(1) Use four screws and lockwashers to attac filter to the mounting bracket.

(2) Reconnect two hydraulic lines.

(3) Service transmission in accordance with rent lubrication order.

NOTE

Refer to current lubrication order for maintenance instructions of internal oil filter screen.

(4) Reinstall forward panel under the right fender.

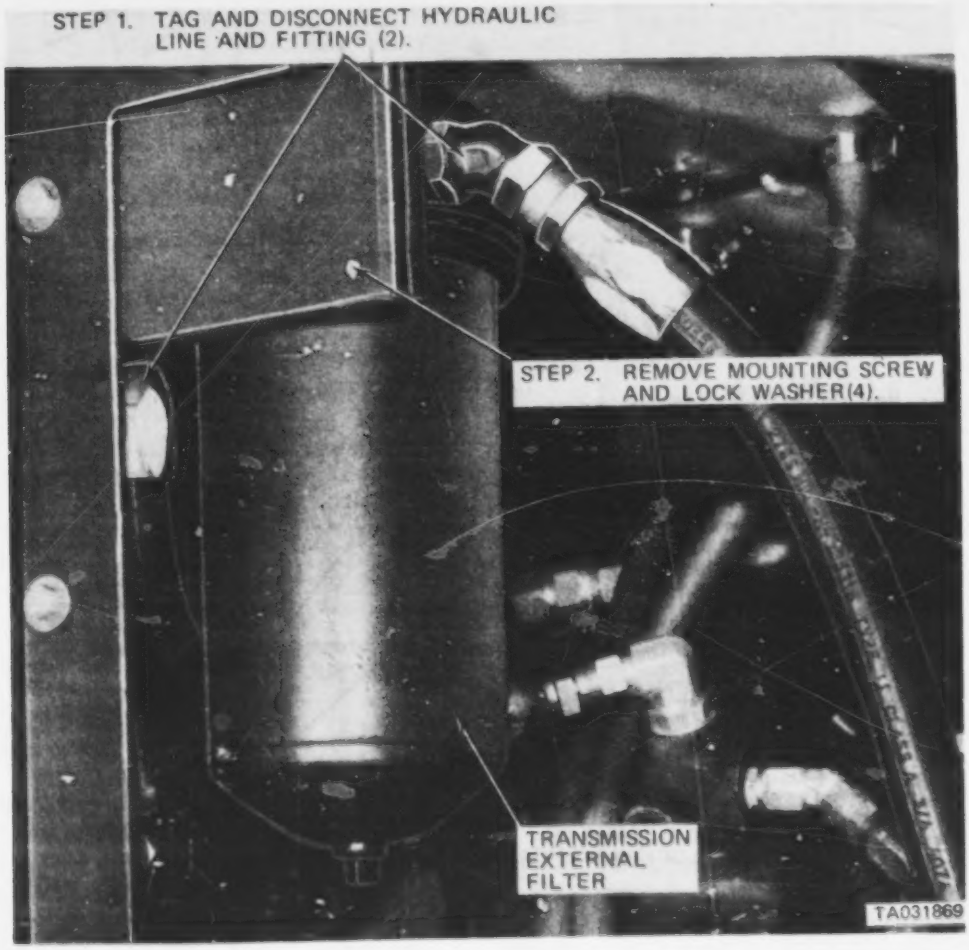

STEP 1. TAG AND DISCONNECT HYDRAULIC LINE AND FITTING (2).
STEP 2. REMOVE MOUNTING SCREW AND LOCK WASHER(4).
TRANSMISSION EXTERNAL FILTER
TA031869

Figure 4-30. Transmission external filter, removal and installation.

4-54. Transmission Linkage

a. General. Check all linkage between operator's controls and transmission frequently. Remove console panel cover and inspect the linkage for proper lubrication, cleanliness, wear, damage, and freedom of operation.

(1) Speed control linkage. Make sure the operator's control (figure 2-1) is positioned to correspond exactly with the detent positions of the transmission speed control valve. If out of adjustment, report to direct support maintenance.

(2) Forward-neutral-reverse control linkage. Make sure the operator's control (figure 2-1) is positioned to correspond exactly to the transmission control valve detents. If out of adjustment, report to direct support maintenance.

Section XIII. MAINTENANCE OF THE PROPELLER SHAFTS

4-55. Propeller Shaft and Yoke Flange

a. Inspection. Inspect propeller shafts and yoke flanges for cracks, breaks, broken welds, or other damage.

b. Service. Service propeller shafts and yoke flanges in accordance with current lubrication order.

Section XIV. MAINTENANCE OF THE BRAKES

4-56. General

This section contains information on the maintenance of those components of the brake system which is the responsibility of organization maintenance personnel.

4-57. Service Brakes

a. General. The service brakes are of the expander-tube-type, hydraulically operated. Pressure is supplied by an engine-driven hydraulic pump, and application is controlled by an applicator valve located under the operator's floor plate. The brake system is supplied with oil (OE/HDO 10) from the main hydraulic reservoir. Brake adjustment is accomplished automatically by slack adjusters (figure 4-31) located in the hydraulic lines between the applicator valve and the wheel brake assemblies. No provision is made for manual adjustment. If adjustment malfunction occurs which cannot be corrected by the bleeding process, report to direct support maintenance. Do not attempt to repair a defective slack adjuster, replace it. Lining wear can be detected by observing the arc of the brake lining retract springs. Retract springs are visible on inboard side of brake assembly just below the outer circumference of the backing plate. Flattened springs (with the brakes off) indicate the need for lining replacement. With lining in good condition, springs will form a shallow arc. Check brakes for air after the first shift of operation.

b. Hydraulic Brake System Bleeding Procedure.

(1) Fill reservoir with hydraulic oil (OE/HDO 10).

NOTE

Reservoir must be free of dirt. A screen should be provided in the reservoir to keep out foreign particles.

(2) With the engine idling, open each bleeder valve (located on top of automatic slack adjuster, figure 4-31) and depress brake pedal until oil flows free of air. Close bleeder valves.

(3) Apply brakes, holding pedal down for at least 10 seconds. Repeat this cycle three times, allowing 30 seconds between applications.

(4) Release brakes and open all four bleeder valves. Bleed fluid from valve until flow stops, then close bleeder valves.

(5) Repeat steps 3 and 4 until no air can be detected escaping from fluid.

(6) Repeat the entire bleeding procedure if the brakes show any evidence of dragging or overheating during the first few hours of operation.

NOTE

Brakes should be checked for air after the first shift of operation.

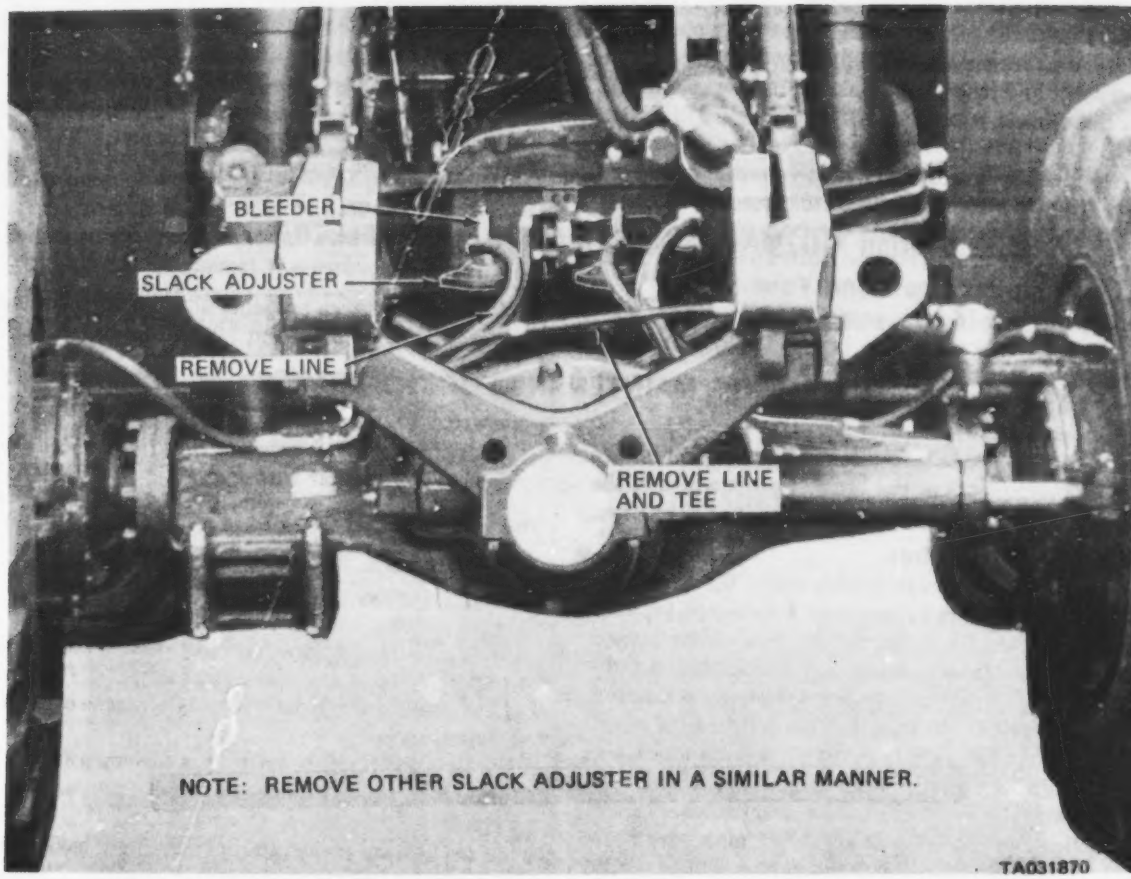


Figure 4-31. Slack adjusters and lines, removal and installation.

4-58. Parking Brake Cable and Lever

a. Removal. For access to the parking brake cable, remove the cockpit floor plate. Refer to figure 4-32 and remove the parking brake cable and lever.

b. Cleaning and Inspection.

(1) Clean the parking brake cable and lever with an approved cleaning solvent.

(2) Inspect the cable for broken wires or kinks. Inspect handbrake lever and mounting brackets for cracks, breaks and damaged parts. Replace all defective parts.

c. Installation. Refer to figure 4-32 and install the parking brake cable and lever.

d. Adjustment.

(1) Release parking brake.

(2) Remove handbrake yoke pin and cotter (figure 4-32).

(3) Turn yoke clockwise to tighten brake and c terclockwise to loosen brake.

(4) Replace handbrake yoke pin and cotter pi

(5) Minor adjustment is made by turning knurled adjusting knob located at the top of handbrake lever. Turn clockwise to tighten; c terclockwise to loosen.

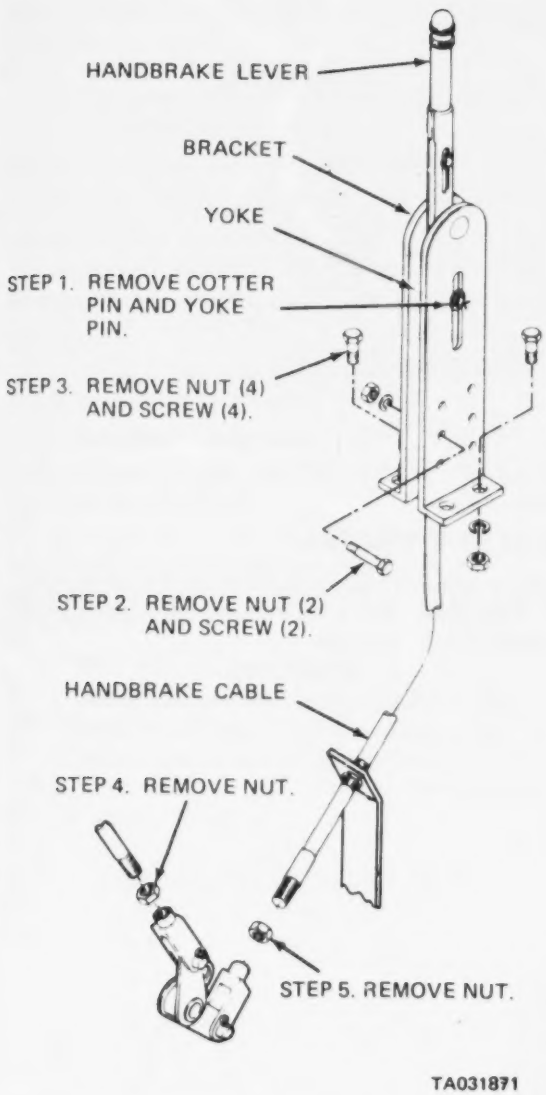


Figure 4-32. Parking brake cable and lever, removal and installation.

4-59. Slack Adjusters and Lines

a. Removal. Refer to figure 4-31 for location of slack adjusters and remove as follows:

(1) Tag and disconnect two hydraulic lines to each slack adjuster.

NOTE

Cap all lines when disconnected to prevent foreign material from entering the brake system.

(2) Remove two screws, nuts and lock washers attaching each slack adjuster to the main frame. Remove the four slack adjusters.

b. Cleaning and Inspection.

(1) Clean slack adjuster with an approved cleaning solvent and dry thoroughly.

(2) Inspect for corrosion, cracks, and loose connections. Check hoses for cuts and deterioration.

c. Installation. Refer to figure 4-31 and install the slack adjusters as follows:

(1) Use two screws, nuts and lockwashers to mount each of the four slack adjusters to the main frame.

(2) Reconnect two hydraulic lines to each of the slack adjusters.

d. Bleeding. After installation of slack adjusters, refer to paragraph 4-75b and bleed the hydraulic brake system.

4-60. Brake Accumulator Cylinder (figure 4-33)

a. General. The accumulator is provided to store energy for a limited number of brake applications. The accumulator system provides pressure for the brake system even when the engine is not operating. The accumulator is provided with a free piston and is charged with nitrogen at approximately 275 psi. For access to the accumulator cylinder, remove the forward panels under the rear fenders.

b. Inspection. Inspect the accumulator for loose or corroded fittings or other damage.

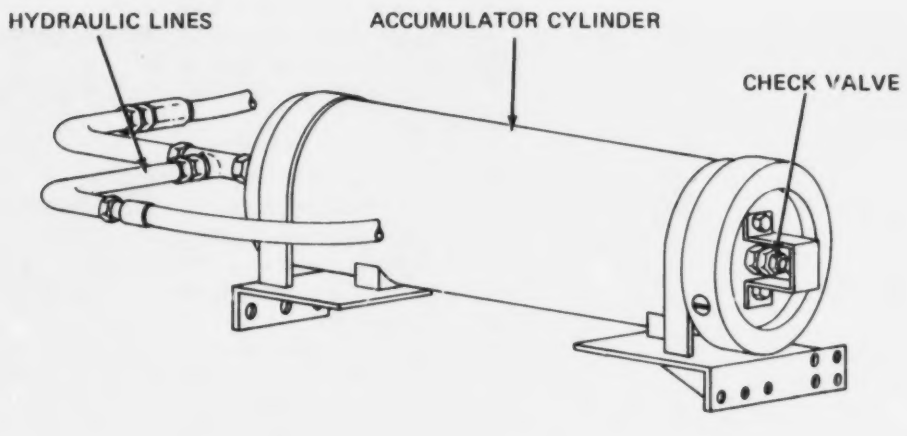


Figure 4-33. Brake accumulator cylinder.

Section XV. MAINTENANCE OF THE WHEELS

4-61. Wheel Flanges, Wheels and Tires

a. Removal. Refer to figure 4-34 and remove wheel flanges, wheels and tires.

b. Cleaning and Inspection.

(1) Clean the wheels and wheel flanges with an approved cleaning solvent.

(2) Inspect the tires for cuts and deterioration. Check lockring, rim, wheel flanges, wheels and nuts for cracks, breaks and dents. Replace all defective parts.

c. Installation. Refer to figure 4-34 and install wheel flanges, wheels and tires.

WARNING

Insure lockring is properly seated before inflating tire. Serious injury to personnel may result should lockring snap out of seat.

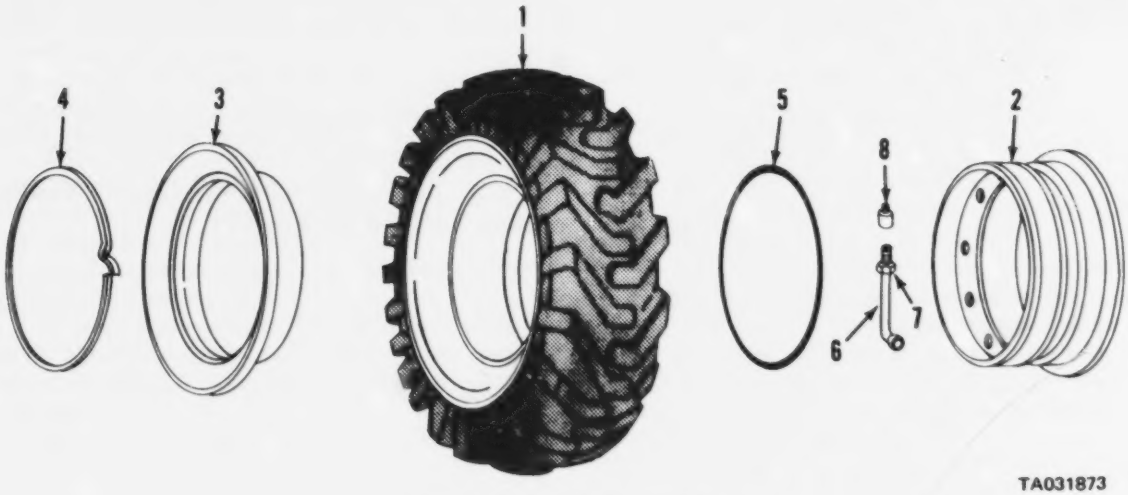


Figure 4-34. Tire and wheel assembly.

Section XVI. MAINTENANCE OF THE STEERING SYSTEM

4-62. General

The steering system is fully hydraulic with a mechanical followup. Pressure is supplied by two hydraulic pumps, and the oil source is the main hydraulic reservoir. The four-wheel steer capability is controlled by a series of links located under the driver's compartment. The modes of steering (two-wheel, four-wheel cramp, and four-wheel crab) are controlled by a three-position hydraulic cylinder anchored on the pitman arm and acting upon the steering actuator arm. A valve, located in the link anchored on the rear cross shaft bell crank and the forward end of the steering actuator arm, con-

trols the action of rear-wheel steering by hydraulic pressure.

CAUTION

Do not operate the forklift truck with cockpit compartment doors open.

4-63. Tie Rods and Tie Rod Ends

a. Removal. Refer to figure 4-35 and remove tie rods and tie rod ends as follows:

(1) Remove cotter pin and nut from each end of the tie rod and remove tie rod and tie rod ends as an assembly.

(2) Remove two nuts and screws to remove tie rod end from each end of tie rod.

b. Cleaning and Inspection.

(1) Clean tie rods and tie rod ends with an approved cleaning solvent.

(2) Inspect the tie rods and tie rod ends for cracks, bends and breaks. Inspect the pins for proper fit. Inspect nuts for stripped threads and proper fit. Replace all defective parts.

c. Installation.

(1) Attach two tie rod ends to each tie rod, using two screws and nuts at each end.

(2) Attach tie rod assembly to the forklift truck using a slotted nut and cotter pin at each end. Adjust to straight ahead, no toe in.

NOTE

After installation, lubricate in accordance with current lubrication order.

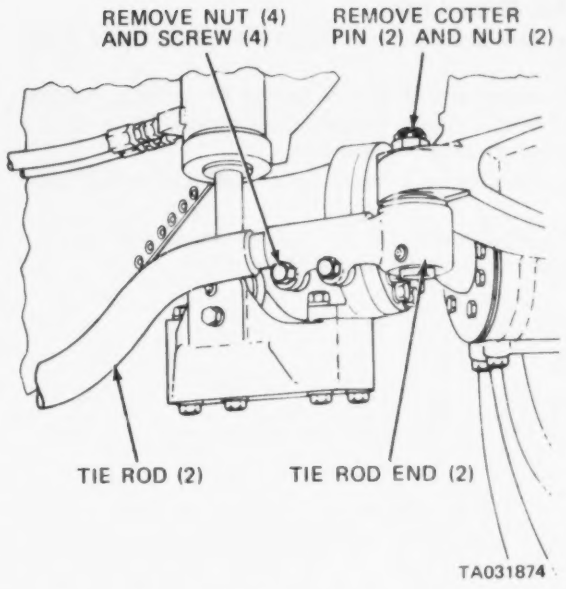


Figure 4-35. Tie rods and tie rod ends, removal and installation.

4-64. Steering Wheel

a. Removal. Refer to figure 4-36 and remove steering wheel.

b. Inspection. Inspect steering wheel post for cracks, breaks and freedom of movement. Check steering wheel for breaks. Replace a defective steering wheel.

c. Installation. Refer to figure 4-36 and install steering wheel.

NOTE

Torque steering wheel retaining nut to 35 foot pounds, and stake.

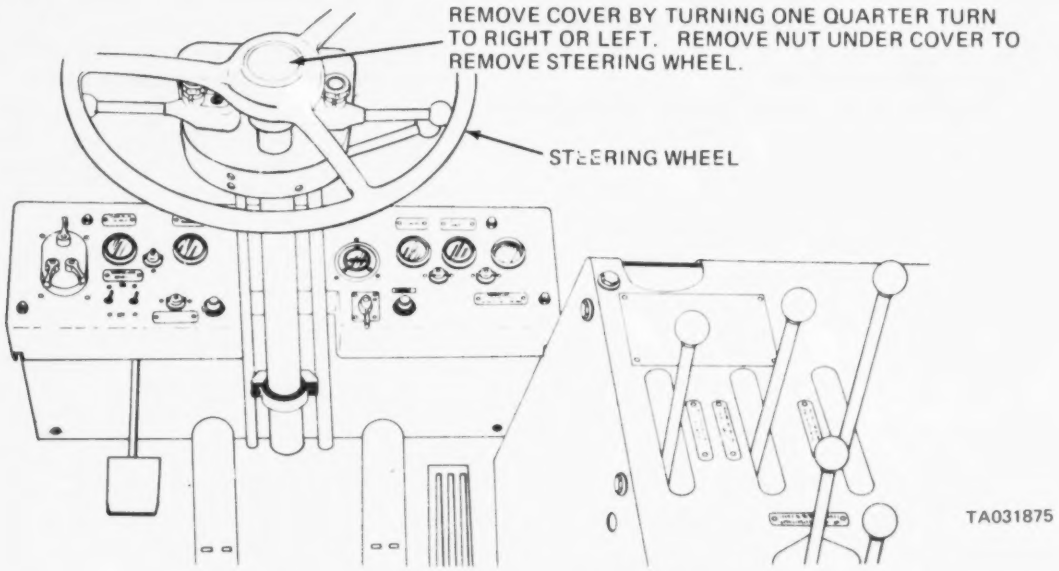

REMOVE COVER BY TURNING ONE QUARTER TURN TO RIGHT OR LEFT. REMOVE NUT UNDER COVER TO REMOVE STEERING WHEEL.
STEERING WHEEL
TA031875

Figure 4-36. Steering wheel, removal and installation.

4-65. Drag Link

a. Removal. Refer to figure 4-37 and remove drag link.

b. Inspection. Inspect drag link for binding, breaks and bends. Check mounting hardware for security. Replace a defective drag link.

c. Installation. Refer to figure 4-37 and install drag link.

d. Adjustment. Tighten nut, then back off approximately ⅛ turn and install cotter pin.

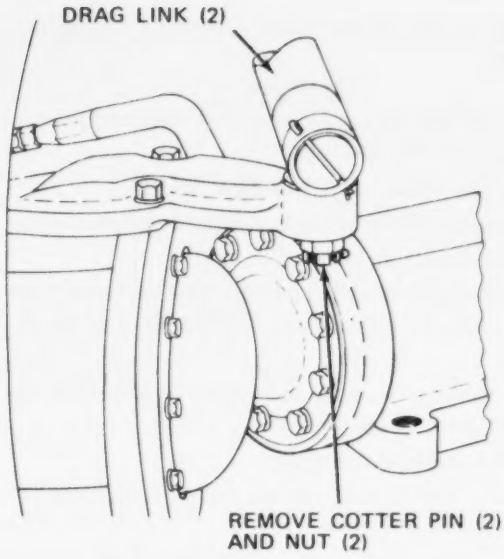


Figure 4-37. Drag link, removal and installation.

Section XVII. MAINTENANCE OF HYDRAULIC PUMPS AND HOSE

4-66. Rear Steering Pump

a. General. The rear steering pump is mounted on the torque converter and supplies pressure for the rear steering cylinders only. For access to the rear steering pump, remove the forward panel under the right rear fender.

b. Removal. Refer to figure 4-38 and remove the rear steering pump.

c. Cleaning and Inspection.

(1) Wipe the pump clean using a cloth dampened with dry cleaning solvent (P-D-680).

(2) Inspect the body and cover for cracks a damage. Replace defective pump with another new serviceable pump.

d. Installation.

(1) Install a new gasket between pump and torq converter. Refer to figure 4-38 and install the r steering pump by reversing the removal procedure.

(2) Reconnect four hydraulic lines.

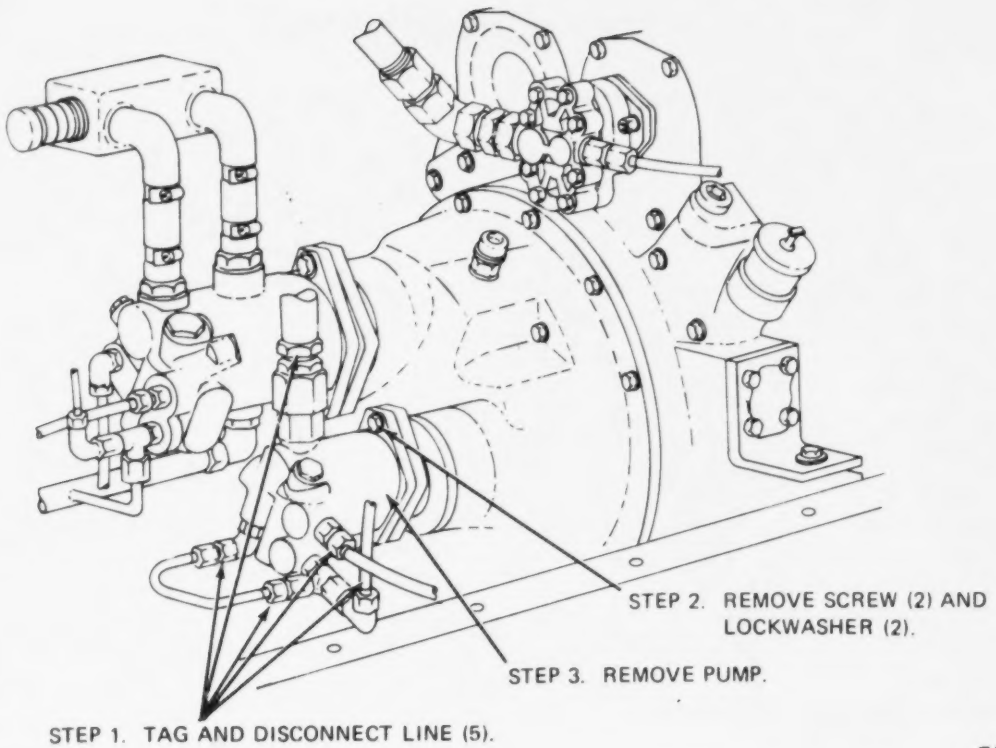


Figure 4-38. Rear steering pump, removal and installation.

4-67. Main Hydraulic Pump

a. General. The main hydraulic pump is a dual pump. The larger portion of the pump supplies hydraulic pressure to the lift cylinders and to the extension cylinders. The front or smaller portion of the pump supplies pressure for front wheel steering. For access to the main hydraulic pump, remove the forward panel under the right rear fender.

b. Removal. Refer to figure 4-38 and remove main hydraulic pump and cap all lines. Pump is located on the front of the torque converter directly above the output shaft.

c. Cleaning and Inspection.

(1) Clean the main hydraulic pump with an approved cleaning solvent and dry thoroughly.

(2) Inspect the pump for cracks, breaks, loose hardware and leaks. Replace a defective pump.

d. Installation. Refer to figure 4-39 and install the main hydraulic pump by reversing removal procedure.

NOTE

When pump failure occurs and metal particles contaminate the hydraulic oil, the complete hydraulic system oil and filters must be changed, as indicated by the contamination indicator (figure 4-41).

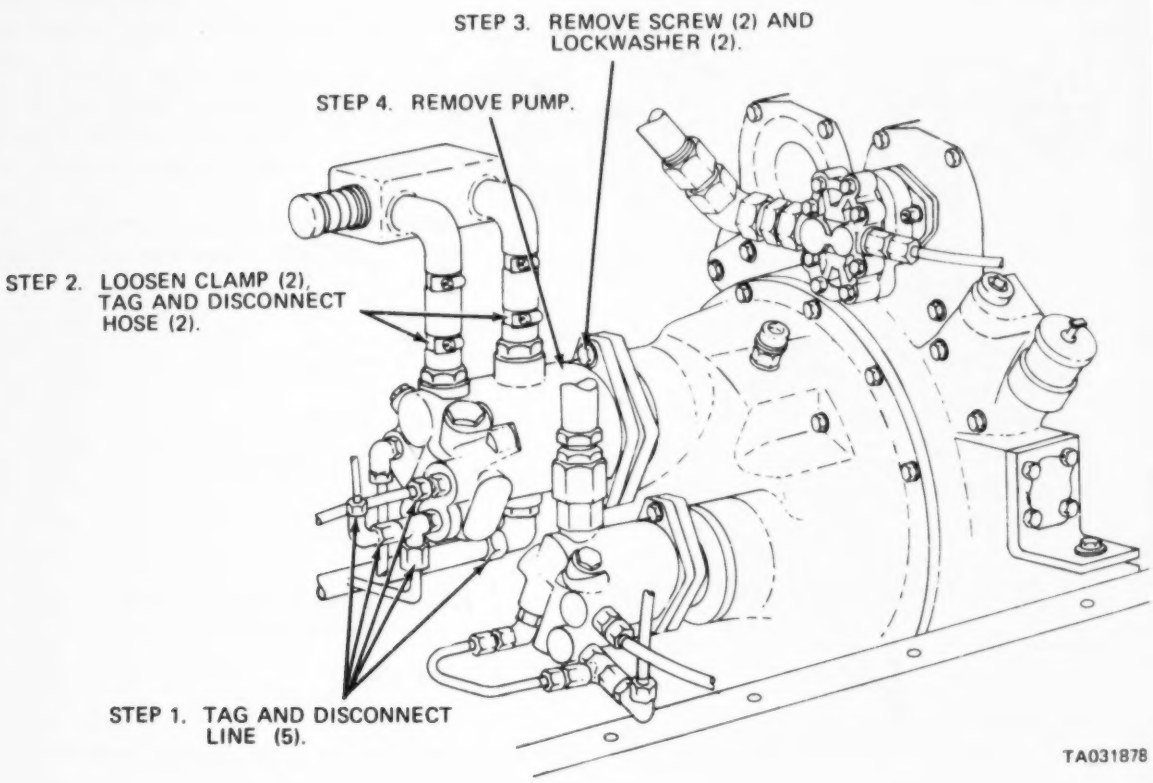

STEP 3. REMOVE SCREW (2) AND LOCKWASHER (2).
STEP 4. REMOVE PUMP.
STEP 2. LOOSEN CLAMP (2), TAG AND DISCONNECT HOSE (2).
STEP 1. TAG AND DISCONNECT LINE (5).
TA031878

Figure 4-39. Main hydraulic pump, removal and installation.

4-68. Engine-Driven Hydraulic Pump

a. General. The engine-driven hydraulic pump supplies hydraulic pressure to the brakes, side shift cylinder and oscillator cylinder. For access to the engine-driven hydraulic pump, remove the forward panel under the right rear fender.

b. Removal. Refer to figure 4-40 and remove the engine-driven pump and cap all hydraulic lines. The pump is mounted on the engine flywheel housing above the torque converter.

c. Cleaning and Inspection.

(1) Clean pump with an approved cleaning solvent and dry thoroughly.

(2) Inspect pump for cracks and leaks. Replace defective pump.

d. Installation. Refer to figure 4-40 and install the engine-driven hydraulic pump by reversing the removal procedure.

NOTE

When pump failure occurs and metal particles contaminate the hydraulic oil, the complete hydraulic system oil and filters must be changed, as indicated by the contamination indicator (figure 4-41).

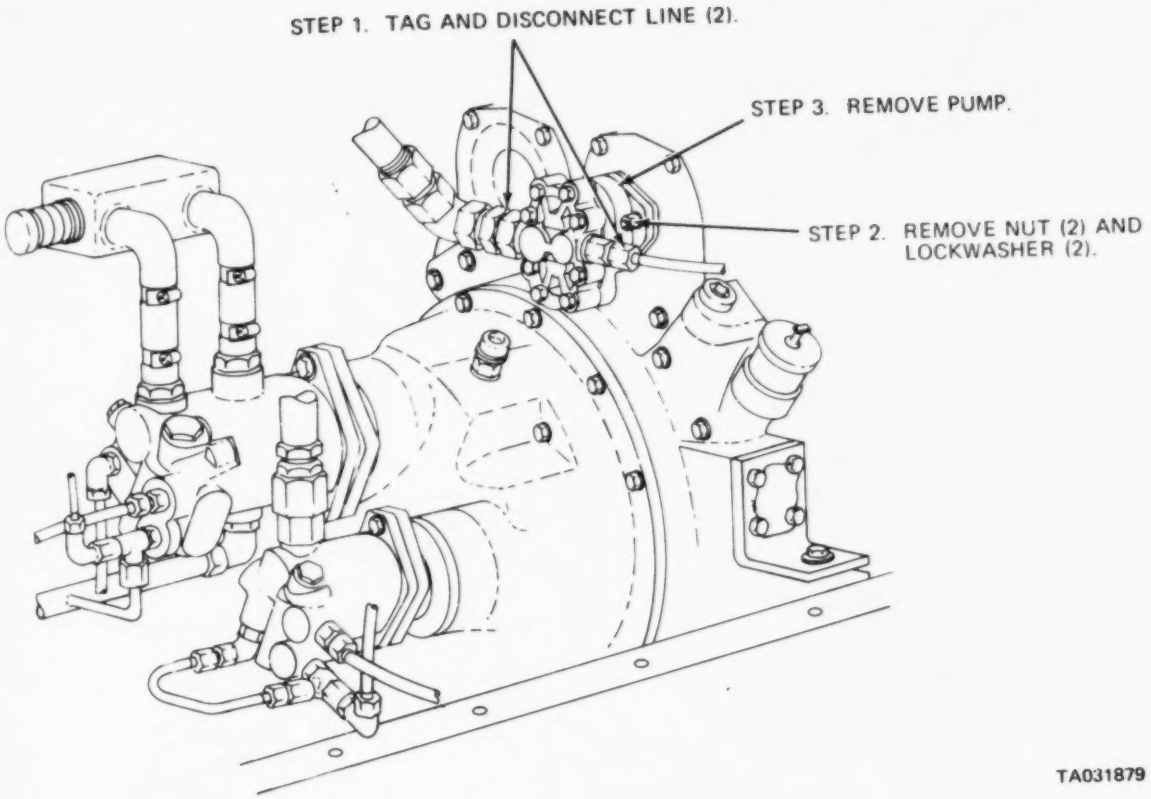


Figure 4-40. Engine-driven hydraulic pump, removal and installation.

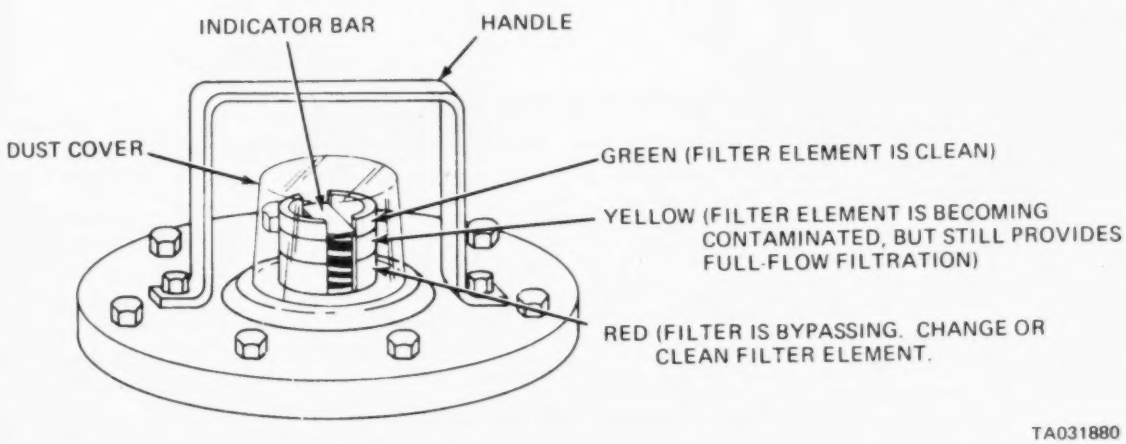

INDICATOR BAR
HANDLE
DUST COVER
GREEN (FILTER ELEMENT IS CLEAN)
YELLOW (FILTER ELEMENT IS BECOMING CONTAMINATED, BUT STILL PROVIDES FULL-FLOW FILTRATION)
RED (FILTER IS BYPASSING. CHANGE OR CLEAN FILTER ELEMENT.
TA031880

Figure 4-41. Contamination indicator.

4-69. Hydraulic Hose

a. General. Hydraulic hoses used on the forklift are equipped with reusable fittings. The hose is available in bulk and may be cut to length as required. High pressure hose is constructed with a 2-wire braid. Hose size is determined by a dash number on the hose or fitting. For example, a -12 on the hose or fitting indicates size in sixteenths of an inch: -12 ± 12/16 or 3/4 inch. Refer to figure 4-42 for installation of fittings on high pressure hose.

b. Positioning of Hoses. When replacing a hose on the forklift truck, make sure that it does not chafe. On hydraulic cylinders, such as the tilt cylinder, extension cylinder, and lift cylinder, make sure that hoses are positioned in such a manner that the hose will not chafe or be cut in operating the unit.

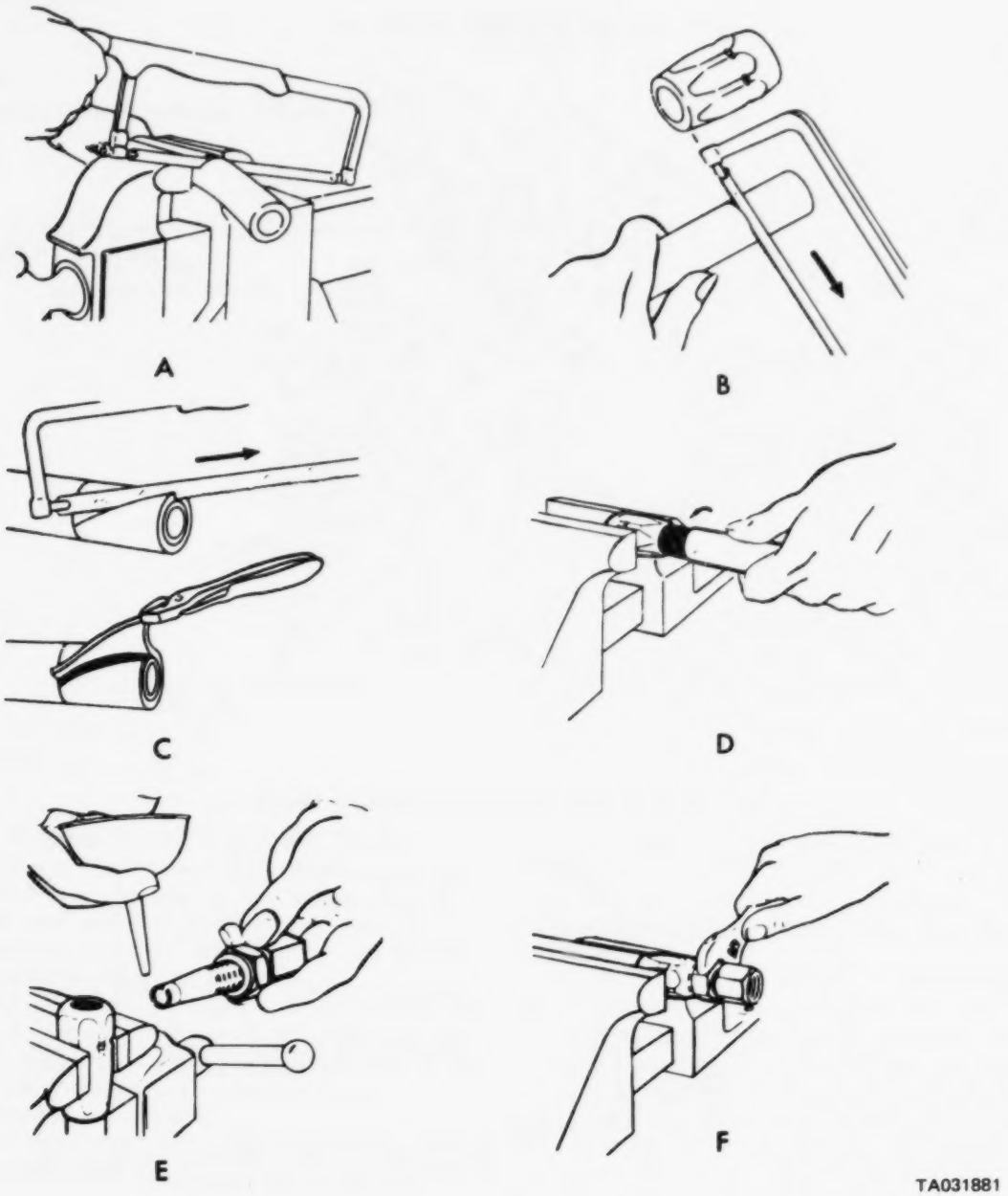


Figure 4-42. Installing high pressure hose fittings.

Section XVIII. MAINTENANCE OF HOOD AND BODY

4-70. Engine Hood and Panels

a. Removal. Refer to figure 4-43 and remove the engine hood and side panels.

b. Cleaning and Inspection.

(1) Clean all parts thoroughly using approved dry cleaning solvent (P-D-680) or equal.

(2) Remove rust with a wire brush.

(3) Inspect the hood and panels for dents, crack and other damage. Inspect hardware for wear, crack and other damage. Replace all defective parts.

c. Installation. Refer to figure 4-43 and install t engine hood and side panels by reversing the remov procedure.

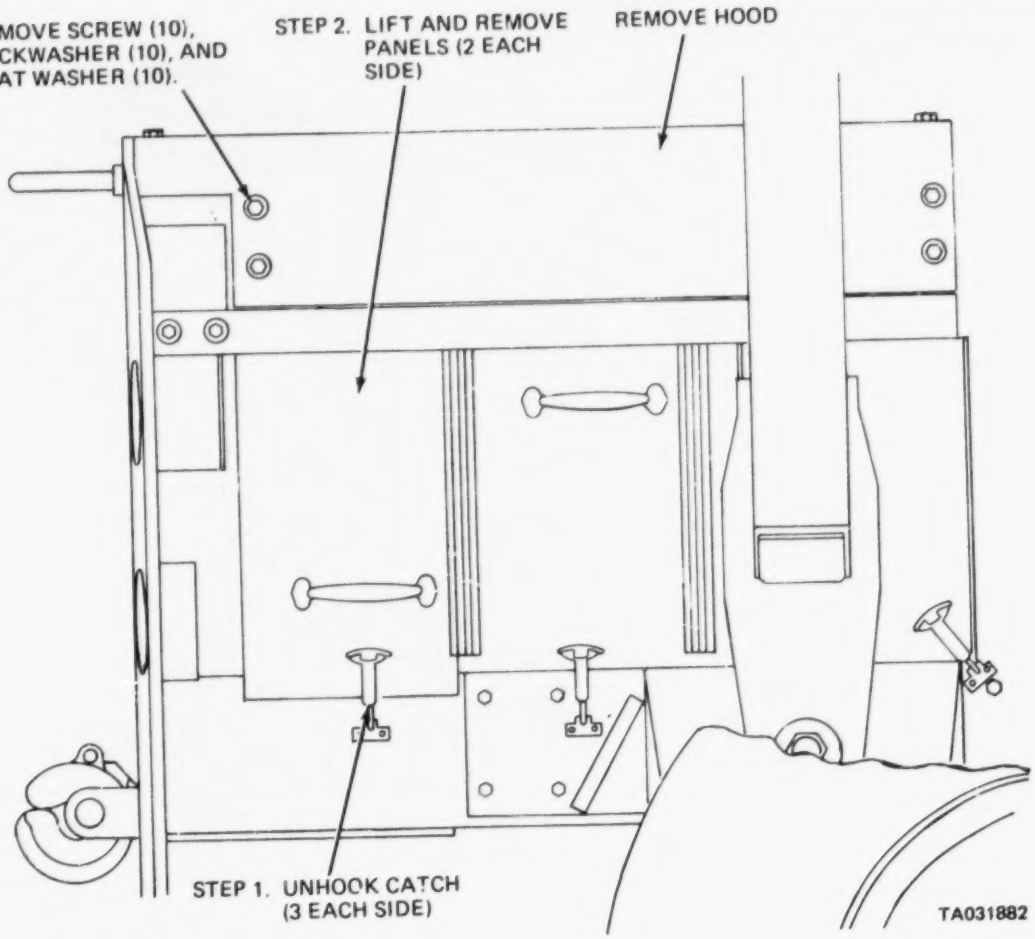

STEP 3. REMOVE SCREW (10), LOCKWASHER (10), AND FLAT WASHER (10).
STEP 2. LIFT AND REMOVE PANELS (2 EACH SIDE)
REMOVE HOOD
STEP 1. UNHOOK CATCH (3 EACH SIDE)
TA031882

Figure 4-43. Engine hood and panels, removal and installation.

4-71. Roll Over Protective Structure (ROPS)

a. Removal.

(1) Remove floodlight (para 4-41).

(2) Refer to figure 4-44: remove nine screws (1) and clips (2) to remove floodlight wire (3) from ROPS.

(3) Remove two screws (4) and lockwashers (5) holding bottom of ROPS to attachment structure.

(4) Attach a hoisting device to lift ROPS. Remove two nuts (6), bolts (7) and washers (8) holding ROPS to vehicle frame. Lift ROPS clear of vehicle and remove.

b. Inspection. Inspect ROPS for cracks, breaks or other damage. Inspect mounting hardware for wear, cracks or breaks. Replace defective parts.

c. Installation.

(1) Use a suitable hoisting device to lift ROPS into place.

(2) Install two lockwashers (5) and screws (4) to pull ROPS into position in attachment structure.

(3) Install nine screws and clips (1, 2) and attach floodlight wire (3) to ROPS.

(4) Install floodlight (para 4-41).

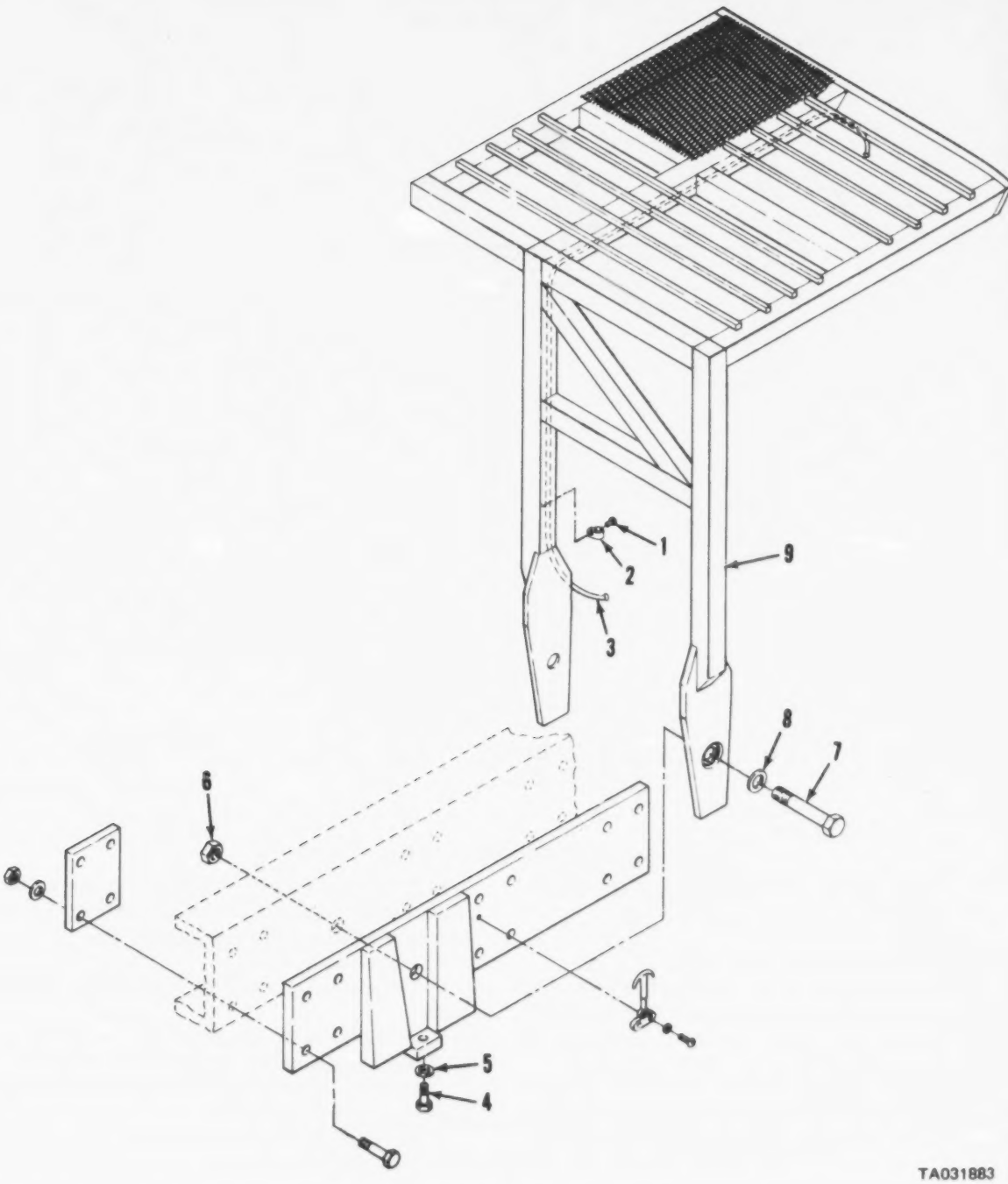


Figure 4-44. Roll over protective structure, removal and installation.

4-72. Seat

a. Removal. Refer to figure 4-45 and remove the seat.

b. Cleaning and Inspection.

(1) Clean controls and mounting hardware with an approved cleaning solvent and dry thoroughly.

(2) Inspect the mounting hardware for cracks breaks. Replace all defective parts.

c. Installation. Refer to figure 4-45 and install as follows: reposition seat on base and attach with washers, lockwashers and nuts.

d. Adjustment. Forward and aft adjustment ma

accomplished by pulling the seat adjustment handle outward. This disengages the locking mechanism and allows the seat to move forward and back along the slide rails. When the desired seat position is obtained, release the handle and the seat will lock in place.

REMOVE NUT (4), LOCKWASHER (4), AND WASHER (4), AND LIFT SEAT FROM BASE
PULL OUT ON LOCKING HANDLE, SLIDE SEAT FORWARD OR BACK, AND RELEASE HANDLE TO LOCK SEAT IN PLACE
TA031884

Figure 4-45. Seat removal, installation and adjustment.

4-73. Counterweight and Pintle

a. Removal. Refer to figure 4-46 and remove the counterweight and pintle as follows:

(1) Remove cotter pin and slotted nut attaching pintle to counterweight and remove pintle.

(2) Support the counterweight from below. Remove four nuts, four lockwashers, eight flat washers and four screws attaching counterweight to main frame.

b. Inspection. Inspect pintle for proper locking operation, breaks and cracks. Check all mounting hardware for corrosion, cracks and breaks. Replace defective parts.

c. Installation. Refer to figure 4-46 and install the counterweight and pintle by reversing the removal procedure.

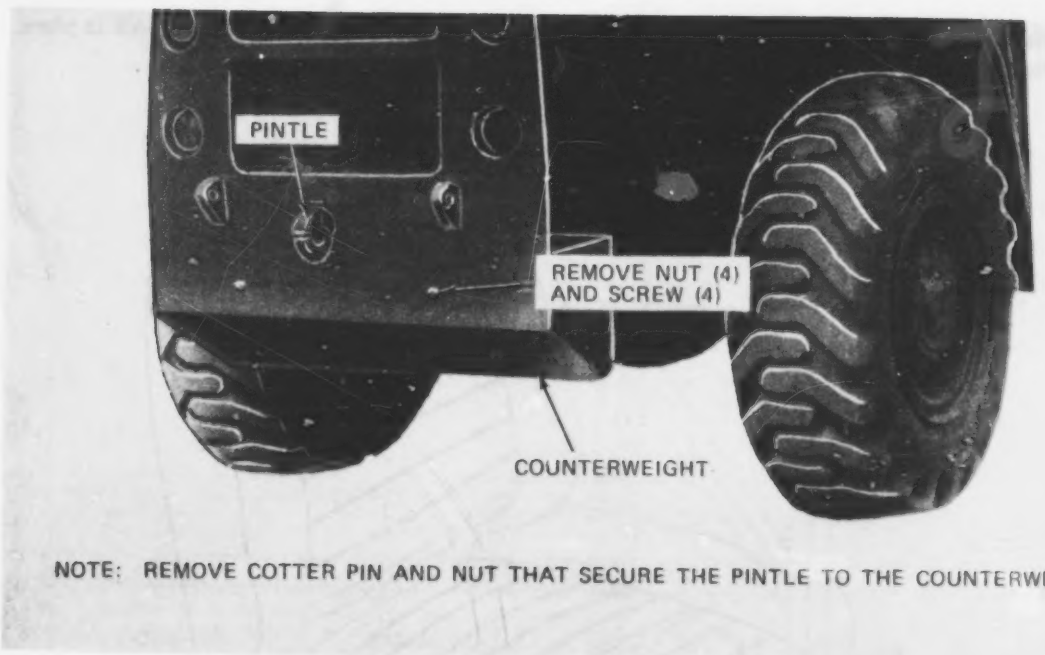


Figure 4-46. Counterweight and pintle, removal and installation.

Section XIX. MAINTENANCE OF THE FORK CARRIAGE

4-74. Fork Carriage

a. Removal. Refer to figure 4-47 and remove the fork carriage.

b. Cleaning and Inspection.

(1) Clean the carriage with dry cleaning solvent (P-D-680).

(2) Inspect the fork carriage for breaks or crack weld. Inspect pins for wear. Replace all defec mounting hardware.

c. Installation. Refer to figure 4-47 and install fork carriage by reversing the removal procedure.

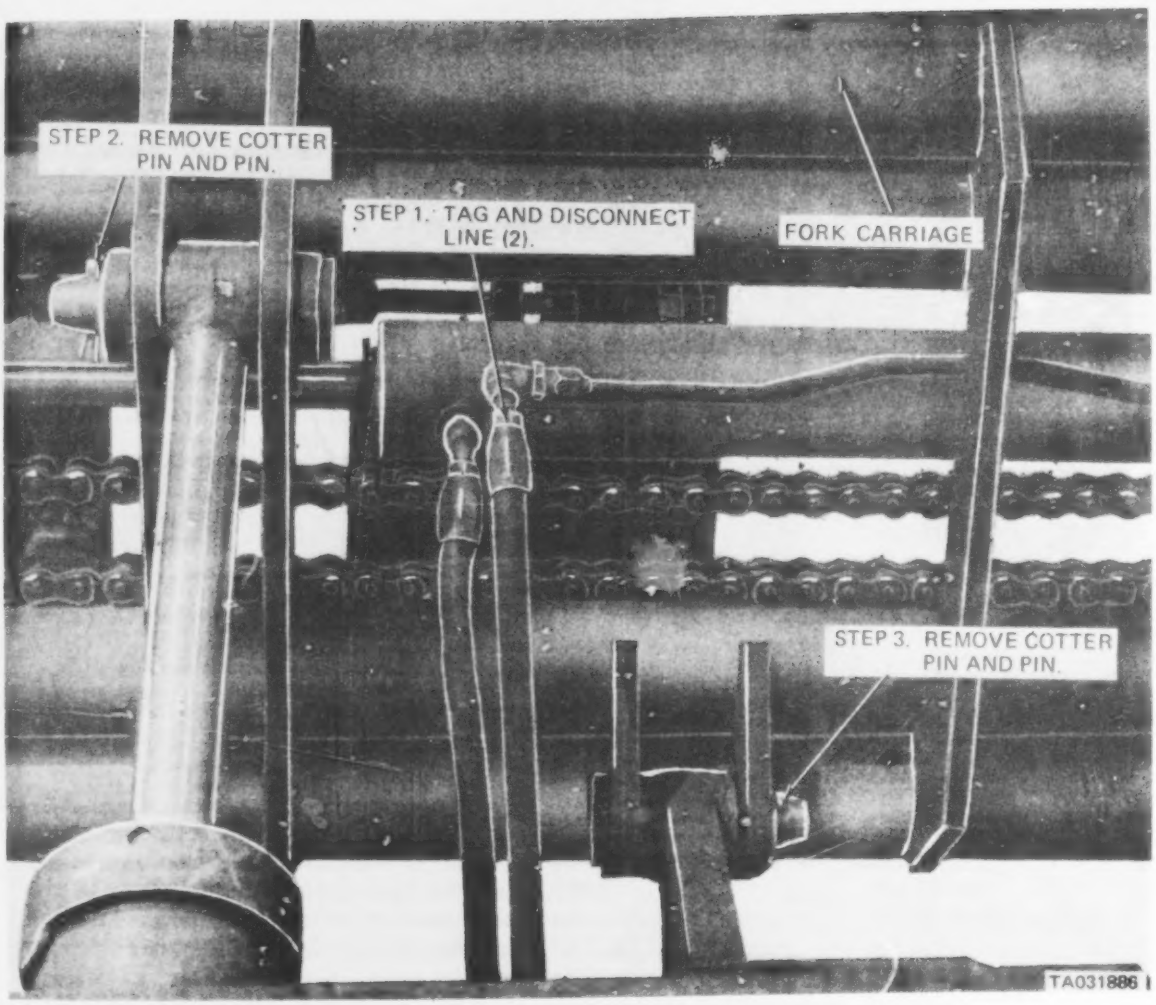


Figure 4-47. Fork carriage, removal and installation.

4-75. Side Shift Roller Chain, Cylinder and Forks

a. Removal.

(1) Block carriage on 2-inch x 4-inch blocks so that forks can be shifted manually. Loosen hoses slowly, allowing pressure to leak down.

(2) Refer to figure 4-48 and remove roller chain, cylinder and forks.

b. Cleaning and Inspection.

(1) Clean the roller chain, cylinder and fork with dry cleaning solvent (P-D-680).

(2) Inspect the chain for kinks, broken or cracked links. Inspect cylinder for leaks. Replace all defective parts.

c. Installation. Refer to figure 4-48 and install the side shift roller chain, cylinder and forks by reversing the removal procedure.

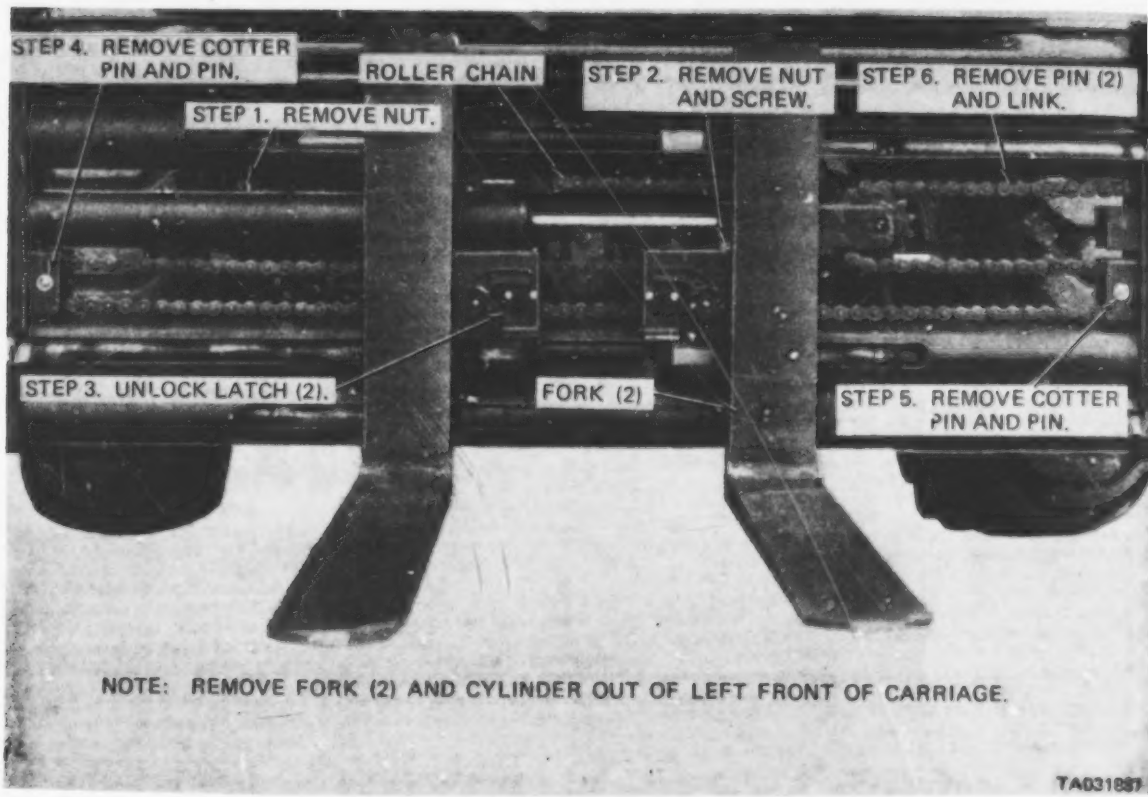

STEP 4. REMOVE COTTER PIN AND PIN.
ROLLER CHAIN
STEP 2. REMOVE NUT AND SCREW.
STEP 6. REMOVE PIN (2) AND LINK.
STEP 1. REMOVE NUT.
STEP 3. UNLOCK LATCH (2).
FORK (2)
STEP 5. REMOVE COTTER PIN AND PIN.
NOTE: REMOVE FORK (2) AND CYLINDER OUT OF LEFT FRONT OF CARRIAGE.
TA031887

Figure 4-48. Side shift roller chain, cylinder and forks, removal and installation.

APPENDIX A
REFERENCES

A-1. Publication Indexes

The following indexes should be consulted frequently for latest changes or revision and for new publications relating to material covered in this technical manual.

Military Publications:

Index of Army Motion Pictures and related audio-visual aids ..... DA Pam 108-1
Index of administrative publications..... DA Pam 310-1
Index of blank forms ..... DA Pam 310-2
Index of doctrinal, training and organizational publications ..... DA Pam 310-3
Index of technical manuals, technical bulletins, supply manuals (types 7, 8 and 9), supply bulletins, and lubrication orders ..... DA Pam 310-4

A-2. Forms

Refer to TM 38-750, The Army maintenance management system (TAMMS), for instructions on the use of maintenance forms pertaining to the material.

A-3. Field Manuals, Supply Bulletins, Technical Bulletins and Technical Manuals

Operation and maintenance of ordnance material in cold weather (0° to -65° F.).. TM 9-207
Inspection, care and maintenance of anti-friction bearings ..... TM 9-214

A-4. Lubrication

Truck, lift, fork, diesel engine, pneumatic tired wheels, rough terrain, 6000 lb capacity, 24 inch load center (Anthony model MLT6-2) (Army model MHE 230) w/ Detroit diesel engine model 5043-7000 ..... LO 10-3930-634-12-1 and -2
Fuels, lubricants, oil and waxes ..... C 9100-IL

A-5. Paint

Painting instructions for field use ..... TM 43-0139

A-6. Maintenance

Organizational maintenance and repair of pneumatic tires and inner tubes ..... TM 9-2610-200-20
Use of antifreeze solutions and cleaning compounds in engine cooling systems.... TB 750-651
The Army maintenance management systems (TAMMS)..... TM 38-750
Operator and organizational maintenance repair parts and special tools list..... TM 10-3930-634020P
Operator and organizational maintenance manual for Lead-acid storage batteries ..... TM 9-6140-200-12
Safe use of cranes, crane-shovels, draglines and similar equipment near electric power lines..... TB 385-101
Welding: theory and application..... TM 9-237
Inspection, care and maintenance of anti-friction bearings ..... TM 9-214
Operation and maintenance of ordnance material in cold weather (0° to -65° F.).. TM 9-207

A-7. Shipment and Storage

Preservation of USAMECOM mechanical equipment for shipment and storage... TB 740-97-2
Administrative storage of equipment ..... TM 740-90-1

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component and the work measurement time required to perform the functions by the designated maintenance level. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions or explanatory notes for a particular maintenance function.

B-2. Explanation of Columns in Section II

a. Column (1), Group Number. A number is assigned to each group in a top down breakdown sequence. The applicable groups are listed in the MAC in disassembly sequence beginning with the first group removed.

b. Column (2), Functional Group. This column contains a brief description of the components of each numerical group.

c. Column (3), Maintenance Functions. This column lists the various maintenance functions (A through K). The lowest maintenance level authorized to perform these functions is indicated by a symbol in the appropriate column. Work measurement time standards (the active repair time required to perform the maintenance function) are shown directly below the symbol identifying the maintenance level. The symbol designations for the various maintenance levels are as follows:

C—Operator or Crew
O—Organizational maintenance
F—Direct support maintenance
H—General support maintenance
D—Depot maintenance

The maintenance functions are defined as follows:

A. *Inspect.* To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards through examination.

B. *Test.* To verify serviceability and detect early signs of failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

C. *Service.* Operations required periodically to keep an item in proper operating condition, i.e., to clean, to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

D. *Adjust.* To maintain within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

E. *Aline.* To adjust specified parts of an item to bring about optimum or desired performance.

F. *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

G. *Install.* The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

H. *Replace.* The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

I. *Repair.* The application of maintenance services (inspect, test, service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

J. *Overhaul.* The maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publication. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

K. *Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurement (hours/miles, etc.) considered in classifying Army equipment/components.

d. Column (4), Tools and Equipment. This column is provided for referencing by code the special tools and test equipment, (sec III) required to perform the maintenance functions (sec II).

e. Column (5), Remarks. This column is provided for referencing by the code the remarks (sec IV) pertinent to the maintenance functions.

B-3. Explanation of Columns in Section III

a. Reference Code. This column consists of a number and a letter separated by a dash entered from column 4 on the MAC. The number references the special tools and test equipment requirements and the letter represents the specific maintenance function the item is to be used with. The letter is representative of columns A through K on the MAC.

b. Maintenance Level. This column shows the lowest level of maintenance authorized to use the special tools or test equipment.

c. Nomenclature. This column lists the name or identification of the tools or test equipment.

d. Tool Number. This column lists the manufacturer's code and part number, or Federal stock number of tools and test equipment.

B-4. Explanation of Columns in Section IV

a. Reference Code. This column consists of two letters separated by a dash, entered from column (5), Section II. The first letter references the Remark and the second letter references a maintenance function, column (3), A through K, to which the remark applies.

b. Remarks. This column lists information pertinent to the maintenance function being performed, as indicated on the MAC, Section II.

Section II. ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)
			Maintenance category					
Group number	Component/assembly	Maintenance function	C	O	F	H	D	Tools and equipment
01	ENGINE							
0100	Engine Assy	Inspect	0.1	0.2				
		Service	.5	1.5				
		Adjust		0.4				
		Replace			8.0			
		Repair				2.0		
		Overhaul					50.0	
0100	Engine Mounts	Inspect			0.1			
		Replace			2.0			
0101	Head Assy	Inspect			0.1			
		Replace			1.5			
		Repair			2.4			
		Overhaul				14.5		
0102	Crankshaft	Inspect				0.3		
		Replace				20.0		
		Repair					8.0	
0103	Flywheel & Housing	Inspect		0.2				
		Replace			8.0			
		Repair			2.0			
0104	Piston & Rods	Inspect				0.2		
		Replace				4.0		
		Repair				4.0		
0105	Camshaft & Gear Train	Inspect			0.2			
		Replace				20.0		
		Repair				8.0		
0105	Rocker Arm & Related Parts	Inspect			0.2			
		Replace			1.0			
		Repair			1.0			
0106	Pump Oil & Related Parts	Replace				4.0		
		Repair				3.0		
0106	Element, Oil Filter	Service		0.5				
		Replace		0.5				
0106	Oil Cooler	Inspect			0.1			
		Test			1.0			
		Replace			0.5			
0106	Breather, Crankcase Dipstick & Filler Pipe	Service		0.1				
		Replace		0.1				

Section II. ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)
			Maintenance category					
Group number	Component/assembly	Maintenance function	C	O	F	H	D	Tools and equipment
0106	Instruments & Gauges	Inspect	0.1					
		Replace		0.5				
0108	Manifold, Exhaust	Inspect	0.1					
		Replace		0.7				
03	FUEL SYSTEM							
0301	Injectors	Inspect			0.5			
		Test				1.0		
		Replace			3.0			
		Repair				3.0		
0302	Injector Linkage	Inspect			0.1			
		Adjust			0.5			
		Replace			1.0			
		Repair			1.5			
0302	Pump, Fuel	Test		0.6				
		Replace		1.0				
		Repair			2.0			
0302	Hose, Lines, Fittings	Inspect	0.1					
		Replace		0.5				
0304	Air Cleaner	Replace		0.5				
0304	Element, Air Cleaner	Inspect	0.1					
		Service	0.3					
		Replace						
0305	Blower	Replace			0.5			
		Repair				2.0		
0305	Manifold, Air Intake	Inspect		0.1				
		Replace			0.3			
		Repair			0.5			
0306	Tank, Fuel	Service	0.3					
		Replace			1.0			
		Repair			2.0			
0308	Governor, Engine	Adjust			0.5			
		Replace			1.0			
		Repair			2.0			
0309	Element, Fuel Filter	Service		0.7				
		Replace		1.0				
0309	Fuel, Filter Assy	Service		0.7				
		Replace		1.5				
0309	Strainer, Fuel	Service		1.0				
		Replace		1.5				
0311	Starting Aid Assy	Replace		1.0				
		Repair		0.5				
0312	Throttle, Control	Inspect	0.1					
		Adjust		0.5				
		Replace		0.5				
04	EXHAUST SYSTEM							
0401	Muffler & Pipes	Inspect	0.1					
		Replace		1.0				
05	COOLING SYSTEM							
0501	Radiator	Inspect			0.1			
		Test			0.5			
		Service	0.2					
		Replace			1.5			
		Repair			2.0			
0503	Thermostat & Housing	Inspect		0.1				
		Replace		0.5				

Section II. ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)
			Maintenance category					
Group number	Component/assembly	Maintenance function	C	O	F	H	D	Tools and equipment
0503	Hoses, Clamps & Fittings	Inspect	0.1					
		Replace		0.3				
0504	Pump, Water	Inspect	0.1					
		Replace		1.0				
		Repair			1.5			
0505	Fan Guard	Replace		1.0				
		Repair			1.0			
0505	Fan, Pulley & Hub	Inspect	0.1					
		Replace		0.5				
0505	Fan Drive Belt & Tightener	Inspect	0.1					
		Adjust	0.1					
		Replace		0.5				
0505	Generator Drive Belt & Tightener	Inspect	0.1					
		Adjust	0.1					
		Replace		0.5				
0505	Fan Disconnect Control Linkage	Inspect	0.1					
		Adjust		0.1				
		Replace		0.5				
06	ELECTRICAL SYSTEM							
0601	Generator & Mounting Brackets	Inspect		0.1				
		Test		0.5				
		Replace		0.5				
		Repair			2.0			
0602	Regulator	Inspect		0.1				
		Test		0.5				
		Replace		0.5				
		Repair			1.5			
0603	Starter & Relay Solenoid	Inspect		0.1				
		Test		0.5				
		Replace		0.5				
		Repair			2.0			
0607	Control Panel	Inspect	0.1					
		Test		0.1				
		Replace		0.5				
0607	Gages, Switches & Indicators & Lights	Inspect	0.1					
		Test		0.1				
		Replace		0.5				
0611	Horn	Test	0.1					
		Replace		0.5				
0612	Batteries, Box, Holddown & Cables	Inspect	0.1					
		Test	0.3					
		Service	0.3					
		Replace		1.0				
0612	Slave Receptacle Connector	Inspect	0.1					
		Test	0.1					
		Replace		0.5				
07	TRANSMISSION & TORQUE CONVERTER							
0708	Torque Converter	Test			0.2			
		Service		0.1				
		Replace			8.0			
		Rebuild					8.0	
0708	Hose, Line & Fittings	Inspect	0.1					
		Replace		0.5				
0710	Transmission	Test			0.2			
		Service		1.0				

Section II. ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)
			Maintenance category					
Group number	Component/assembly	Maintenance function	C	O	F	H	D	Tools and equipment
		Replace			8.0			
		Repair				8.0		
		Rebuild					40.0	
0721	Controls, Transmission Linkage	Inspect	0.1					
		Adjust		0.2				
		Replace		1.5				
0721	Element Oil Filter	Service	0.5					
		Replace		1.0				
0721	Valve, Disconnect	Inspect		0.1				
		Test			0.2			
		Replace			1.0			
0721	Valve, Pressure Regulator	Test			0.2			
		Adjust			0.5			
		Replace			1.0			
0721	Transmission Control Valve Linkage	Inspect		0.2				
		Adjust		0.5				
		Replace			1.0			
09	PROPELLER SHAFTS							
0090	Shaft Assemblies	Inspect		0.1				
		Replace			2.0			
0900	Spider & Bearings	Service		0.2				
		Replace			2.0			
10	AXLE ASSEMBLY							
1000	Axles Front & Rear	Inspect		0.1				
		Service		0.3				
		Replace			8.0			
		Repair				4.0		
		Rebuild					16.0	
1002	Differentials	Service		0.3				
		Replace				4.0		
		Rebuild					8.0	
1003	Planetary Drives	Inspect		0.1				
		Service		0.3				
		Replace			2.0			
		Repair			2.0			
1004	Differential Lock Control	Inspect	0.1					
		Service		0.2				
		Replace		1.0				
		Repair			2.0			
12	BRAKES							
1201	Handbrake Control	Inspect	0.1					
		Adjust		0.1				
		Replace		1.0				
		Repair		0.5				
1201	Brakes, Service	Inspect		0.1				
		Replace			16.0			
1201	Brake Adjusters	Inspect	0.1					
		Replace		1.0				
		Repair			2.0			
1201	Brake Valve	Inspect		0.1				
		Replace			1.0			
		Repair			1.0			
1201	Brake Accumulator	Inspect		0.1				
		Service			1.0			
		Replace			1.0			
		Repair			1.5			

Section II. ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)
			Maintenance category					
Group number	Component/assembly	Maintenance function	C	O	F	H	D	Tools and equipment
13	WHEELS							
1311	Wheel Assembly	Inspect	0.1					
		Service		0.3				
		Replace			1.0			
		Repair			1.0			
1313	Tires	Inspect	0.1					
		Service		0.3				
		Replace		1.0				
		Repair		1.0				
14	STEERING		0.1					
1401	Tie Rods & System Adjustment	Inspect		0.1				
		Adjust			2.0			
		Replace			3.0			
		Repair			0.5			
1401	Drag Link	Inspect		0.1				
		Replace		0.6				
1411	Lines & Fittings	Inspect	0.1					
		Replace		0.5				
		Repair		0.5				
1412	Steering Cylinders	Inspect	0.1					
		Replace			1.0			
		Repair			1.0			
1414	Steering Valve	Adjust			0.5			
		Replace			2.0			
		Repair			3.0			
1501	Roll Over Protective Structure	Inspect	0.1					
		Replace		0.1				
		Repair		1.0				
15	FRAME & TOWING ATTACHMENTS							
1502	Frame & Pintle	Inspect		0.2				
		Repair		2.0				
18	BODY, CAB, HOOD & HULL							
1801	Body, Cab, Hood & Panels	Inspect		0.1				
		Replace		0.1				
		Repair			0.5			
1806	Seats	Adjust	0.1					
		Replace		0.5				
		Repair		0.5				
24	HYDRAULIC LIFT COMPONENTS							
2401	Pump Main (Dual)	Test		0.5				
		Replace		2.0				
		Repair			2.0			
2401	Pump, Rear Steer	Test		0.5				
		Replace		2.0				
		Repair			2.0			
2401	Pump, Engine Driven	Test		0.5				
		Replace		2.0				
		Repair			2.0			
2402	Valves 2 & 3 Spool	Test		0.2				
		Replace			1.5			
		Repair			1.5			
2402	Valves, Holding & Replenishing	Test		0.2				
		Replace			1.0			
		Repair			1.0			

Section II. ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)
			Maintenance category					
Group number	Component/assembly	Maintenance function	C	O	F	H	D	Tools and equipment
2403	Control, Levers & Linkages	Inspect	0.1					
		Adjust		0.2				
		Replace		0.5				
		Repair		0.5				
2404	Cylinder Hydraulic Tilt	Inspect	0.1					
		Test		0.2				
		Replace			1.5			
		Repair			1.5			
2405	Forks, Lifting	Inspect	0.1					
		Adjust		0.1				
		Replace		0.5				
		Repair			1.0			
2405	Boom Assembly	Replace			2.0			
		Repair			4.0			
2405	Cylinder Carriage	Inspect		0.1				
		Replace		0.4				
2405	Cylinder Hydraulic Lift	Inspect	0.1					
		Test		0.2				
		Replace			1.5			
		Repair			1.5			
2406	Filter Hydraulic	Inspect	0.1					
		Service		0.5				
		Replace		0.5				
2406	Hose, Lines, Fittings	Inspect	0.1					
		Replace		0.5				
		Repair		0.5				
2407	Cylinders Hydraulic Oscillation, Slave & Extension	Inspect	0.1					
		Replace			1.0			
		Repair			1.5			
2408	Tank Hydraulic	Inspect	0.1					
		Service		0.2				
		Replace			2.0			
		Repair			2.0			
47	GAGES (NON ELECTRIC)							
4702	Gages, Oil, Water Temp. & Oil Pressure	Inspect	0.1					
		Replace		0.5				

Section III. SPECIAL TOOL AND SPECIAL TEST EQUIPMENT REQUIREMENTS

Reference code	Maintenance level	Nomenclature	Tool number
1-C	F	Regulator, charging accumulator	(19207)
		NSN 4910-00-861-2068	11615420
2-H	F	Injector tool, timing	
		NSN 5220-00-387-9581	
3-I	F	Socket: bearing adjusting nut	(19207)
		NSN 5120-00-009-8602	1912-3-7-8
3-B	O	Gage assembly	(19207)
		NSN 4910-00-776-3355	10884612

Section IV. REMARKS

Reference code	Remarks
*	Estimated single unit manhour repair or replacement.
A-B	Test includes engine operation and compression.
B-H	Aline, metalize and resize.
C-H	Replace ring gear
D-H	Reface

APPENDIX C
BASIC ISSUE ITEMS LIST, ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

C-1. Scope
This appendix lists basic issue items and items troop installed or authorized required by crew/operator for operation and required for the performance of organizational maintenance of the fork lift truck.

C-2. General
This Basic Issue Items, Items Troop Installed or Authorized List is divided into the following sections:

a. Basic Issue Items List-Section II. A list, in alphabetical sequence, of items which are furnished with, and which must be turned in with, the end item.

b. Items Troop Installed Or Authorized List-Section III. A list, in alphabetical sequence, of items which, at the discretion of the unit commander, may accompany the end item, but are not subject to be turned in with the end item.

C-3. Explanation of Columns
The following provides an explanation of columns found in the tabular listings.

a. Source, Maintenance, and Recoverability Codes (SMR).

(1) *Source code.* Indicates the source for the listed items. Source codes are:

Code	Explanation
P	Repair parts, supplied from the GSA/DSA or Army supply system and authorized for use at indicated maintenance categories.
P2	Repair parts which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.
P9	Assigned to items which are NSA design controlled: unique repair parts, which are stocked and supplied by the Army COMSEC Logistic System and which are not subject to the provisions of AR 380-41.
M	Repair parts which are not procured or stocked as such in the supply system but are to be manufactured at indicated maintenance levels.
A	Assemblies which are not procured or stocked as such but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately, and can be assembled to form the required assembly at indicated maintenance categories.
X	Parts and assemblies that are not procured or stocked because the failure rate is normally below that of the applicable end item or component. The failure of such part or assembly should result in retirement of the end item from the supply system.
X1	Repair parts which are not procured or stocked. The requirement for such items will be filled by the next higher assembly or component.
X2	Repair parts which are not stocked and have no foreseen mortality. The indicated maintenance category requiring such repair parts will attempt to obtain the parts through cannibalization or salvage. The item may be requisitioned, with exception data, from the end item manager for immediate use.
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DS and GS level. These assemblies will not be stocked above DS and GS level or returned to depot supply level.

Note: Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded X1.

(2) *Maintenance code.* Indicates the lowest category of maintenance authorized to install the listed item. Capabilities of higher maintenance categories are considered equal or better. Maintenance codes are:

Code	Explanation
C	Crew/Operator
O	Organizational maintenance

(3) *Recoverability code.* Indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are nonrecoverable. Recoverability codes are:

Code	Explanation
R	Repair parts (assemblies and components) which are considered economically reparable at direct and general support maintenance levels. When the item is no longer economically reparable, it is normally disposed of at the GS level. When supply considerations dictate, some of these repair parts may be listed for automatic return to supply for depot level repair as set forth in AR 710-50. When so listed, they will be replaced by supply on an exchange basis.
S	Repair parts and assemblies which are economically reparable at DS and GS activities and which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically reparable, they will be evacuated to a depot for evaluation and

Code	Explanation
	analysis before final disposition.
T	High dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such items will be repaired or overhauled at depot maintenance activities.
U	Repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high dollar value, or reusable casings or castings.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. Indicates the Federal item name and a minimum description required to identify the item.

d. Unit of Measure (U/M). Indicates the standard or basic quantity by which the listed item is used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, e.g., ea, in, pr, etc.

e. Quantity Furnished with Equipment (Basis Issue Items Only). Indicates the quantity of the item furnished with the equipment.

f. Quantity Authorized (Items Troop Installed or Authorized Only). Indicates the quantity of the item authorized to be used with the equipment.

g. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item number.* Indicates the callout number used to reference the item on the illustration.

Section II. BASIC ISSUE ITEMS LIST

(No Basic Issue Items are authorized)

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

National stock Number	Description	Unit of meas	Qty auth
7510-00-889-3494	Binder, Loose Leaf	Ea	1
7520-00-559-9618	Case, Operation and Maintenance Manual	Ea	1
4210-00-889-2221	Extinguisher, Fire	Ea	1

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By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

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Major General, United States Army
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Key West, FL 33040

DATE 14 January 1975

PUBLICATION NUMBER	DATE	TITLE
TM 9-1430-550-34-1	7 Sep 72	Unit of Radar Set AN/MPQ-50 Tested at the HFC

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PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.
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IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

NOTE TO THE READER:

Your comments will go directly to the writer responsible for this manual, and he will prepare the reply that is returned to you. To help him in his evaluation of your recommendations, please explain the reason for each of your recommendations, unless the reason is obvious.

All comments will be appreciated, and will be given immediate attention. Handwritten comments are acceptable.

For your convenience, blank "tear out" forms, preprinted, addressed, and ready to mail, are included in this manual.

SAMPLE

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